THE DEVELOPMENT AND PRELIMINARY EVALUATION OF A PROGRAMMED COURSE OF INSTRUCTION IN ORCHESTRATION FOR THE STRINGED INSTRUMENTS

Thesis for the Degree of M. M.

MICHIGAN STATE UNIVERSITY
RICHARD D. WORTHING

1968

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ABSTRACT

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by Richard D. Worthing

The continual rise in enrollment in college and university music departments in the last few years has created a situation in which the traditional, personal manner of teaching music is no longer practical. One solution to this problem has been the adoption and adaptation of certain mass teaching methods previously considered inappropriate in the arts, and in music particularly. Programmed instruction is one such method.

Programming has already been applied to some of the basic factual aspects of music such as fundamental vocabulary and part-writing principles. Certain subjective aspects of music such as melody harmonization and aural perception have also been successfully presented in a programmed format. These efforts have all been concerned, however, with basic, core material required of all first and second year college music majors. The next logical step was to test the application of programmed instruction in more advanced, hence more subjective, subject areas. The present experiment is an effort in this direction.

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In developing such material, two principal questions must be answered. Can the subject matter at hand be presented in an intelligible manner in a programmed format? And, can programmed material teach the subject matter as well as, if not better than, traditional class-lecture methods?

The first question was answered through the supervised composition of a linear program of 838 frames on stringed-instrument orchestration. It was found that all necessary subject matter could be satisfactorily presented in this format.

The second question was answered through preliminary testing of the program with small (6-8 students) experimental and control groups. Although such limited testing can hardly be considered conclusive, the results of this preliminary evaluation indicate that more subject matter can be presented in a given amount of time through a programmed course of instruction than through conventional classroom methods.

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THE DEVELOPMENT AND PRELIMINARY EVALUATION OF A PROGRAMMED COURSE OF INSTRUCTION IN ORCHESTRATION FOR THE STRINGED INSTRUMENTS

by

Richard D. Worthing

A THESIS

Submitted to
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in partial fulfillment of the requirements
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Mr. Louis Potter, Mr. a
and Mr. Nelson Cleary,
Michigan State Univers

The overall direc
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Technical assista
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were drawn from the Mu
classes of Dr. Merrell

ACKNOWLEDGMENTS

No experiment of the type presented in this thesis is possible without the assistance, both casual and concentrated, of numerous individuals. Inasmuch as the subject matter contained herein is not to be found anywhere in concise, authoritative form, a sampling of opinion among many accomplished performers provided the basis for the material presented.

A complete listing of contributors would seem unnecessary. However, special acknowledgment is hereby made of the frequent and willing advice offered by Dr. Theodore Johnson, Mr. Romeo Tata, Mr. Louis Potter, Mr. and Mrs. Lyman Bodman, Mr. Dinos Constantinedes and Mr. Nelson Cleary, instructors in stringed instruments at Michigan State University.

The overall direction of the thesis and invaluable training and assistance in the preparation of programmed material provided by my thesis advisor, Dr. Paul Harder, deserve a special word of appreciation.

Technical assistance in the preparation of trial copies of the program for preliminary testing purposes was graciously provided by the Michigan State University Department of Music. Students for the experimental and control groups for the testing situation were drawn from the Music 380 and Music 880, Materials of Music, classes of Dr. Merrell Sherburn and Mr. Thomas Richmond.

CONTENTS

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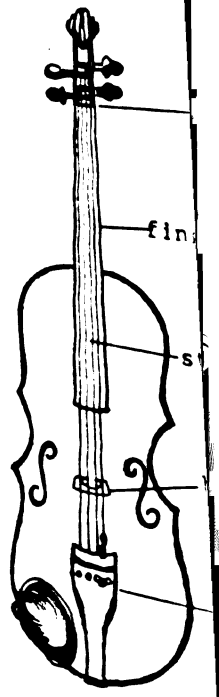
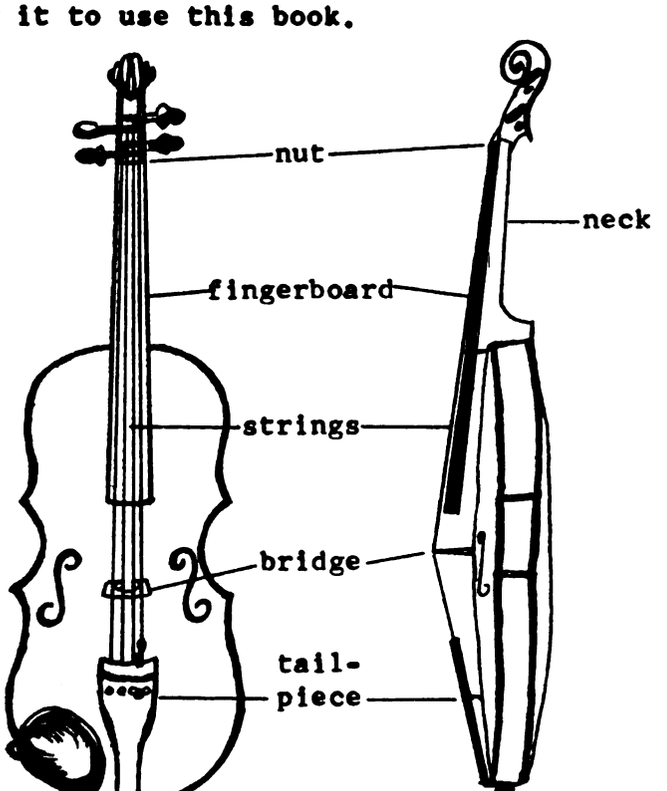


INTRODUCTION

Historically speaking, the string section is the mainstay of the orchestra, although this concept is waning in modern music. The fact that the stringed instruments reached a high level of development before the wind or percussion instruments is a major reason for their long reign. Another reason is their great versatility, expressive range, and endurance. For these reasons we will begin this study of orchestration with a study of the stringed instruments of the modern orchestra.

It is important for the orchestrator to understand the anatomy of the instruments for which he is writing. As the stringed instruments are all similar in design save for size, one illustration will suffice. Memorize the terminology shown on the drawings below as you will need to know it to use this book.



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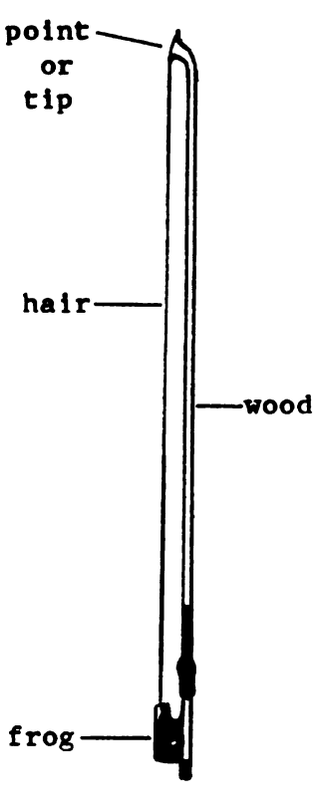


BOW

	1. The smallest of the stringed instruments is the violin. Foreign names for the violin which are found in scores include the following: violino (It.), violon (Fr.), and Violine or Geige* (Ger.). All of these except Geige are easy to recognize because of their similarity to the English name of the instrument. Place a check (✓) before the word below which means violin. ____a. Geige ____b. viola ____c. Bratsche
✓ a.	
	2. Proceed as above. ____a. Bratsche ____b. alto ____c. violino
✓ c.	
	3. List four foreign names for the violin on the lines below.
violino violon Violine Geige (Any order.)	_____ _____ _____ _____

*In German all nouns are capitalized.

4.
To save space in scores the names of instruments are often abbreviated. The abbreviation for violin is Vln.* Place a check before the abbreviation for violin in the list below.

____a. Vc.

____b. Vla.

✓ c. ____c. Vln.

Vln.

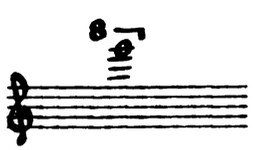
5.
The abbreviation for violin is _____.

6.
The four strings of the violin are tuned as follows:

From this one can deduce that the lowest possible note on the violin is:

(notate)

7.
A practical upper limit for advanced violin players is shown below.



Higher notes are possible but are rare.

(Answer on next page.)

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*Abbreviations in scores are always capitalized.

False.

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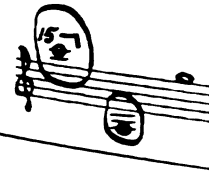
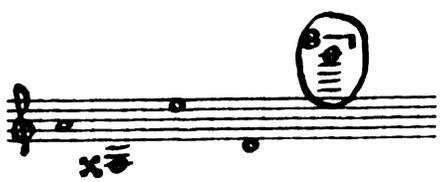


False.

(It is the highest practical note but higher notes are possible.)

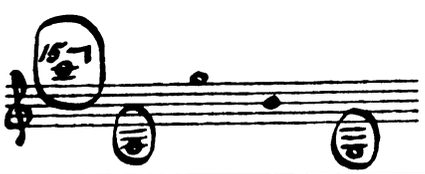
is the highest note possible on the violin.

(True/False) _____.

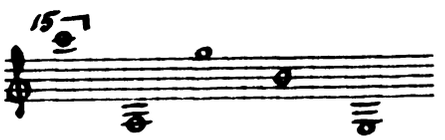


(The F 𝄪 can be played enharmonically as G♮.)

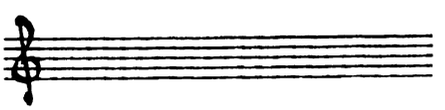
8. Circle those notes in the following group which are not within the practical range of the violin.

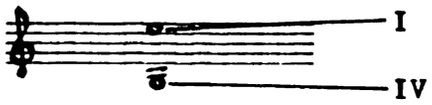


9. Proceed as in Frame 8.



10. Notate the overall practical range of the violin on the staff below.



II	11. For purposes of identification the strings are sometimes numbered with Roman numerals. The "E" or first string is indicated by a I, the "G" or fourth string by a IV, etc.  What Roman numeral would identify the "A" string? _____
a. D b. E c. IV	12. a. III indicates the _____ string. b. I indicates the _____ string. c. What Roman numeral identifies the "G" string? _____
G D A E	13. To what pitches are the strings of the violin tuned? (lowest to highest) _____ _____ _____ _____
(No response necessary.)	14. The two most important aspects of orchestration are uniformity and variety. The balance between those two factors can determine the success or failure of a score. To maintain uniformity where necessary and achieve variety where desirable, one must know the characteristic timbre of each string of the violin.

E	15. The string having the most carrying power is the E string. Some of the reasons for this are its construction, (usually steel wire) greater tuning tension, and the range in which it sounds. A singing, forte melody would be well suited to the _____ string.
would	16. Brilliant is another good term for the E string. A bright, gay passage (would/would not) _____ be suited to the E string.
a. Carrying power. b. Brilliance. c. Clear, ethereal sound. (Or equivalent.)	17. The E string can also produce a clear, ethereal sound when played softly. List three different characteristics of the E string. a. _____ b. _____ c. _____
less	18. The A string may be made of steel or gut. The A string is somewhat weaker than the E string and loses carrying power as the pitch ascends because it is thicker than the E string. The A string has (more/less) _____ carrying power than the E string.

The A string.

The E string

Yes

(Answer on pa

19.
The greater warmth of the A string makes it ideally suited for soft, expressive passages ranging up to:

On what string would the following passage sound best?

Answer: _____

The A string.

20.
Which string is best suited to the following passage? (Consider tempo and dynamics.)

Answer: _____

The E string.

21.
Is the following example appropriate on the A string?

Answer: _____

Yes

22.
The D string, made of gut wound with wire, or entirely wire wound, is the weakest of the four strings. It lacks both the carrying power of the E string and the full, rich tone of the G string.

(Continued on next page.)

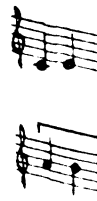
(Answer on next page.)

Soft, quiet,

(Or equival

(No response r

The G



Soft, quiet, subdued.

(Or equivalent.)

For what type of passage do you think the D string would be appropriate?

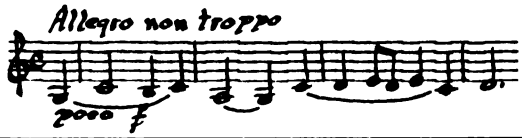
Answer: _____

(No response necessary.)

23.

The G string is also made of gut, or wire, wound with wire and is second only to the E string in sheer power. Its full, rich, dark sound is ideal for broad, sonorus melodies. The following melody is traditionally played entirely on the G string.

Symphony No. 1 Brahms

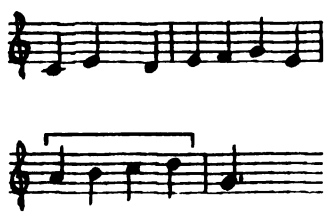


The G string.

24.

On what string would the following example sound best?

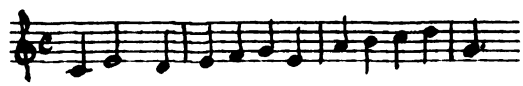
Answer: _____

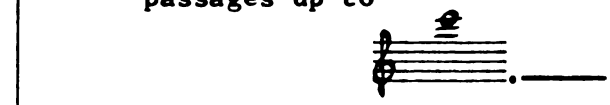


25.

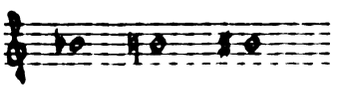
In the second octave above the open pitch the G string becomes somewhat hoarse and nasal sounding.

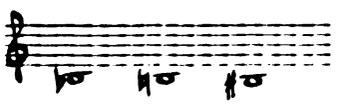
Place a bracket over that portion of the following passage which might sound hoarse and nasal if played on the G string.



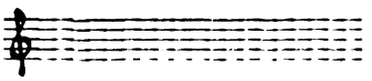
a. E b. G c. A d. D	26. Name the string which best fits each of the following descriptions. a. Most brilliant. _____ b. Rich, dark sound. _____ c. Suitable for soft, expressive passages up to  _____ d. Weakest of the four strings. _____
E G A D	27. List the four strings of the violin in order from most brilliant to weakest. _____ _____ _____ _____
(No response necessary.)	28. An important rule for orchestrators is to achieve the desired effect with the least possible difficulty on the part of the player. In order to do this the orchestrator must have some knowledge of the technique of the instrument for which he is writing. On the violin (and all bowed string instruments) the various pitches are produced by stopping the strings by pressing them down against the fingerboard with one of the fingers of the left hand. This stopping shortens the vibrating length of the string thus raising the pitch.

	29. For pedagogical purposes the fingers of the left hand are numbered, index to little finger, 1-4. Note that this numbering is different than for the piano as the thumb is not used in playing the violin. In terms of the violin, what number indicates the index finger, _____; the ring finger, _____?
1 3	
	30. Traditionally the left-hand technique for the violin has been taught in terms of <u>position</u>. The left hand is in <u>first position</u> when the stopped pitch of the first (index) finger is <u>one letter name</u> above the pitch of the open string. For example, in first position on the D string the first finger may play E♭, E, or E♯. <u>Second position</u> will place the first finger on the second letter name above that of the open string etc. What three possible pitches could the first finger <u>stop</u> (play) in <u>second position</u> on the D string? _____ _____ _____
F♭ F F♯	
	31. What three pitches may the first finger play in <u>third position</u> on the D string? _____ _____ _____
G♭ G G♯	

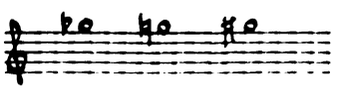




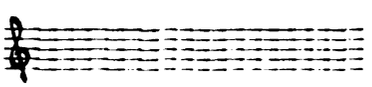
32.
Notate the possibilities that are open to the first finger in first position on the A string.



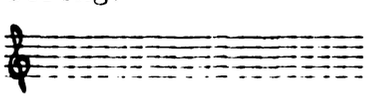
In second position on the G string.



33.
What notes can the first finger stop in first position on the E string?



In second position on the E string?



(No response necessary.)

34.
You will notice that enharmonically speaking there is an overlap of a half step between any two adjacent positions. However, because string players can adjust their intonation and "play in the cracks" so to speak, the F in first position on the E string will traditionally be played higher than the G in second position. The exception to this rule is in twelve-tone music where the tempered scale and its enharmonic equivalents must be adhered to. When scoring this type of music the orchestrator should notate the enharmonic which is easiest to reach and trust the performers to use the appropriate intonation.

B	35. So far we have discussed only the first finger of the left hand. Letting logic prevail, we find that each succeeding finger stops a pitch one letter name above that of the preceding finger. In first position on the G string the first finger stops some kind of A. The second finger will stop some kind of _____.
C D	36. What letter name will the third finger stop in first position on the G string? _____ The fourth finger? _____
B C D E	37. What four letter names can be covered in first position on the A string? _____ _____ _____ _____
F G A B A B C D	38. Continue as in the preceding frame. Second position on the D string. _____ _____ _____ _____ Third position on the E string. _____ _____ _____ _____
(Answer on next page.)	39. The natural span of the left hand encompasses a perfect fourth (ie. F to B♭ or F♯ to B in first position on the E string). (Continued on next page.)

(first and

2nd

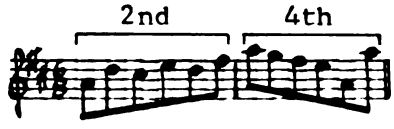
2nd (ar

(No response

2

(first and third.)

How many positions would be used to play the following example on the D string? _____



2nd (and) 4th

40.

What positions would probably be used to play the following example on the A string?

Answer: _____ and _____

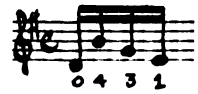
(No response necessary.)

41.

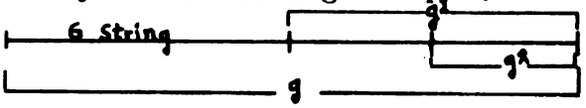
Notes just above or below a given position can be played by using extensions (stretching the left hand) rather than by shifting (changing positions). Consider the following exerpt:

New World Symphony Dvořák

The speed of this passage suggests that it be played on one string (D) and in the same position. The B can be reached by extending the 4th finger upward in first position, but an easier solution is to extend the 1st finger downward in second position. The two possible fingerings are shown below.

first position 

second position 

	42. In what positions could the following pattern be played on the D string using extension?  Answer: _____or_____
1st (or) 2nd	
	43. What one position could be used to play the following pattern on the G string?  Answer: _____
3rd	
	44. It is important to remember that the higher the position, the closer together the fingers must be placed because the sounding length of the string is shorter. Study the following example.  Notice that each successive octave required half as much string to sound as did the preceding octave. Remember that the higher positions are harder to play if scalewise (especially half-step) patterns are required but easier to play when skips are required because a larger interval can be spanned by the same reach of the hand than in a lower position.
(No response necessary.)	

(No response necessary.)

45. The concept of position may also serve as the basis for discussing performer ability. Advanced players may generally be expected to play through the twelfth position (including extensions) on the E string. The D and A strings are harder to play in the upper positions and also "speak" less well as pitch ascends. For these reasons, the sixth position is a practical limit for advanced players on the inside strings. Fifth position is a common limit on the G string.

Twelfth

Sixth

Fifth

46. What position on the E string is considered a general limit for advanced players.? _____

What position is a practical limit on the D and A strings for advanced players? _____

On the G string? _____

It will lower it.

47. For high school players the limits are naturally lower. Fifth position on the E string should be the maximum expected.

How will this affect the upper limit of range for high school performers?

_____

(Answer on next page.)

48. A practical high-note limit for high school performers is

(Continued on next page.)

One octave.

How much lower is this than the general range limit for the violin given at the beginning of this chapter? _____.

Yes.

49. In fifth position on the E string does the range limit expressed in Frame 48 require the use of extension? _____.

No. It is only a half step beyond fifth position and in this area of the string the half steps lie quite close together due to the shorter sounding length of the string.

50. Do you feel that this would be a difficult extension? _____ Why?

_____

_____.

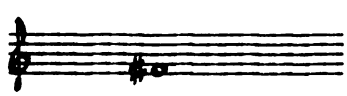
The hand cannot span as many notes in the lower positions because the greater sounding length of the strings places the notes farther apart.

51. For high school performers the use of extensions should be kept at a minimum expecially in the lower positions.

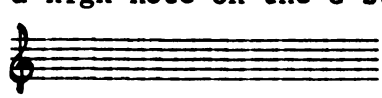
Why would extensions be more difficult in the lower positions? _____

_____

_____



52. On the G string the limit is much lower than on the E string. Third position would be maximum for high school students as a general rule. What limit would this set as a high note on the G string?



(No response nece

No.

Fifth po

(No respon

(No response necessary.)	53. The use of higher positions on the G string is usually limited to solo work for more advanced players. For this reason high school performers are usually not proficient above third position on the G string.
No.	54. On the inside strings, third or fourth position is a safe limit for high school violinists. It would be good to remember that due to pedagogical tradition, less advanced players are more proficient in the odd-numbered positions. (1st, 3rd, 5th) Excluding the use of extensions, is the following example appropriate for high school players on the D string? _____ 
Fifth position.	55. What is the highest position required to play the example in the preceding frame without an extension, on the D string? _____
(No response necessary.)	56. Let us now review the technical limitations for violinists. For advanced players (college or professional) tenth position on the outside strings and eighth on the inside strings are safe. For high school violinists, fifth position on the E string, third position on the G string, and third or fourth position on the inside strings are practical.

E twelfth

A sixth

D sixth

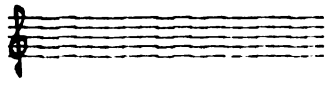
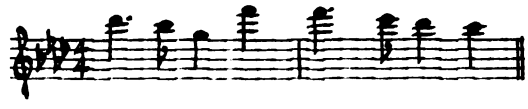
G fifth

E fifth

A third or

D third or

G third

	57. What positions are practical for professional violinists on each string?
E twelfth A sixth D sixth G fifth	E _____ A _____ D _____ G _____
	58. What positions are safe for high school performers on each string?
E fifth A third or fourth D third or fourth G third	E _____ A _____ D _____ G _____
	59. What is the overall practical range for high school violinists? 
Yes.	60. Would the following example be suitable for high school violinists? Symphony No. 2 Ives  Answer: _____

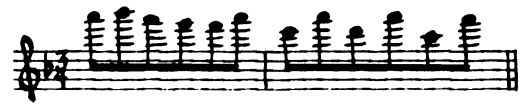
61. For which ability group, high school or professional, would the following excerpt be appropriate considering that it is to be played on the A string?

Answer: _____

Professional.

62. Circle those notes in the following excerpt that would be beyond the range of high school violinists.

Symphony No. 3 Bruckner



63. Could a high school performer be expected to play the following excerpt on the G string?

Symphony No. 3 Mahler

Answer: _____

No.

(No response necessary.)

64. An important factor to remember in reference to these ability standards is that they are only norms. In any given group of performers there are apt to be those who can surpass them and those who cannot measure up at all. If a score is intended for a particular ensemble, check with the players as to their limitations before starting to work.

---

lowest

65. The one aspect of violin technique yet to be discussed is the choice of string for a given note or passage. One usually thinks of a given note as being played on the string whose open pitch is immediately below that note.

Another way of saying this is that a given note is usually played in the (highest/lowest) _____ possible position.

66. Circle those notes in the following group that would normally be played on the D string.

67. Circle those notes in the following group that would usually be played on the E string.

(No response

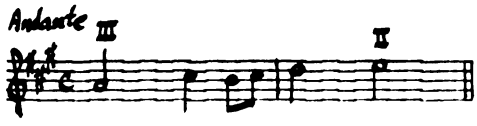
(Answe

(No response necessary.)

68.

For reasons of technical impossibility and uniformity of timbre, notes are not always played on the "usual" string. One technical impossibility is producing vibrato on an open string. If the orchestrator wishes vibrato on a pitch identical to one of the open strings he must mark that note to be played as a stopped pitch on a lower string (usually the next string below the open string not desired). Study the following example.

The "IV" over the D in the above example tells the player that the D should be played as a stopped pitch on the G string rather than on the open D string. The "III" over the A directs the performer to play that note on the D string. In this way the entire passage can be played with vibrato.



69.

Mark the following example so that it can be played entirely with vibrato.

(Answer on next page.)

70.

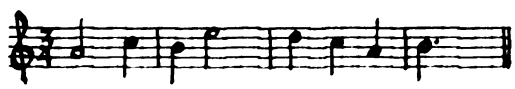
The examples in Frames 68 and 69 are extremely simple for pedagogical reasons. Most performers make the necessary adjustments without being told by judging the character of the music.

(Continued on next page.)

(No response neces

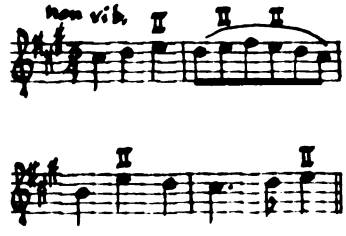
non vib.

Writing non v
the beginning
passage.

(No response necessary.)	Therefore, in orchestral music this practice is not widely used. The rule to follow is: If you think there is any doubt as to how the part should be played, MARK IT!
non vib.	71. Violinists traditionally play long notes with vibrato. If, for reasons of effect, the orchestrator wishes a long note to be played without vibrato it should be marked. Writing "non vib." over the note or passage will achieve the desired effect. If no vibrato is desired on a note that can be played on an open string it is marked writing _____ over the note or passage.
	72. Mark the following passage so that the long notes possible on open strings will be played without vibrato. 
Writing non vib. above the beginning of the passage.	73. Usually when the non-vibrato effect is desired it will involve stopped strings as well as open notes. For these situations write "non vib." above the beginning of the passage. Which method of indicating the non-vibrato effect can be used in all cases? _____ _____.

(No respons

(Answer



74.

Sometimes even in non-vibrato passages the brighter sound of an open string is undesirable. In these cases the notes possible on open strings may be marked with Roman numerals to indicate that they are to be played as stopped pitches.

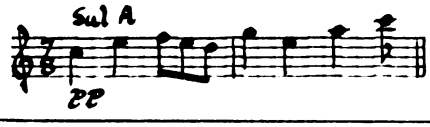
Add the necessary Roman numerals to the following example to show that no open strings are to be used.

(No response necessary.)

75.

As you can see, the above method adds many extra symbols to the music and might confuse the players more than help them. A simpler method is shown below.

"Sul A" means on the A string". This is the recommended method for marking passages of this type.



76.

Mark the following passage so that no open strings will be used.

(Answer on next page.)

77.

Often a composer or orchestrator simply wishes to exploit the unique timbre of a specific string and will want a melody played entirely on that string even though its range would suggest the use of two or three strings. The following excerpt

(Continued on next page.)

(No response n

The G

The forti
dynamic l
be hard t
the weak

(Or equ

(No response necessary.)

is an example of this type of writing.

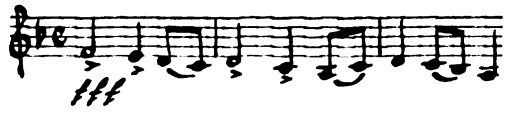
Second Symphony Sibelius

One can see by the dynamic marking that this passage is well suited to the D string. The marking "Sul D" directs the players to use that string.

The G string.

78. What string do you feel would be appropriate for the following passage?

Symphony No. 3 Mahler



Answer: _____

The fortississimo dynamic level would be hard to attain on the weak D string.

(Or equivalent.)

79. Why would the above exerpt probably not sound well on the D string?

_____

_____

_____

80. Mark the following exerpt as to choice of string. Consider dynamics and expression.

The practical r

. The fou

The E string posess

is more subdued, gr

is the weakest of t

sound. The fingers

produce the variou

1-4.

Advanced play

position on the E

and fifth positio

not be expected t

limiting their hi

inside strings ar

limits for perfo

players favor th

definitely in fo

high school viol

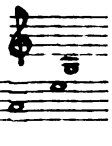
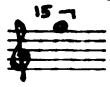
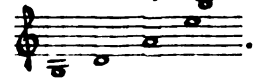
Generally s

possible positi

not always poss

Sul D (or) III.	81. Two ways of marking a passage to be played on the D string are _____ or _____.

SUMMARY

The practical range of the violin is four octaves from  to  . The four strings are tuned as follows:  . The E string posesses the greatest brilliance while the A string is more subdued, growing weaker as the pitch rises. The D string is the weakest of the four and the G string has a full, rich, dark sound. The fingers of the left hand which stop the strings to produce the various pitches are numbered, index to little finger, 1-4.

Advanced players may be expected to play through the twelfth position on the E string, sixth position on the D and A strings, and fifth position on the G string. High school violinists should not be expected to play beyond fifth position on the E string limiting their high note to g^3. Third or fourth position on the inside strings and third position on the G string are practical limits for performers of this level. Remember that less advanced players favor the odd numbered positions (1, 3, and 5). A passage definitely in fourth position would be more difficult for many high school violinists than one in third or fifth position.

Generally speaking, a given note is played in the lowest possible position. For reasons of technique and timbre this is not always possible or desirable. In most cases good players will

make the necessa

where the perfor

with indications

to exploit the u

Few orches

technical aspec

a specific musi

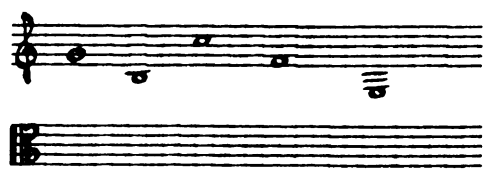
good performer

make the necessary adjustments without being told. In any situation where the performer might "guess wrong" the part should be marked with indications such as "Sul D". These markings may also be used to exploit the unique timbre of one of the strings.

Few orchestrators are complete authorities on all of the technical aspects of the various instruments. When in doubt as to a specific musical situation, the best solution is to consult a good performer on the instrument in question.

	1. The next largest instrument of the string family is the viola. The foreign names for this instrument with which you should be familiar are: viola (It.), alto (Fr.), and Bratsche (Ger.). The Italian name presents no problem as it is identical to English. Place a check (✓) before the equivalent of viola in the following list. ____a. violino ____b. Geige ____c. alto
✓ c.	
	2. Proceed as above. ____a. Kontrabass ____b. Bratsche ____c. Violoncell
✓ b.	
	3. The name viola is identical in the English and _____ languages.
Italian	
	4. Write three foreign names for viola on the lines below. _____ _____ _____
viola alto Bratsche (Any order.)	

(No respon

✓ b.	5. The abbreviation for viola is Vla. Place a check before the abbreviation for viola in the list below. ____a. D.B. ____b. Vla. ____c. Vln.
Vla.	6. The abbreviation for viola is _____.
(No response necessary.)	7. The viola is slightly larger than the violin, but is otherwise identical in construction and manner of playing. For this reason the information concerning the viola can be presented in terms of comparison with the violin.
	8. A very important difference in notation exists between the viola and the violin. Whereas the violin uses the treble clef the viola uses the alto clef almost exclusively.  On the staff provided, show the alto clef equivalents of the following notes: 

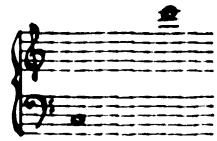
(1)edge

alto

ledger lin

C G

9.
The viola uses the alto clef because of its range:



Considering this range, if viola parts were written in either the treble or bass clef exclusively, many l _ _ _ _ _ lines would have to be used.

(l)edger

10.
Viola parts are written in the _____ clef to minimize the use of _____ _____.

alto

ledger lines

11.
The four strings of the viola are tuned as follows:

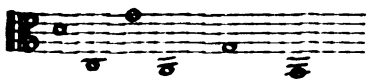
Give the letter names of these pitches.

_____ _____ _____ _____

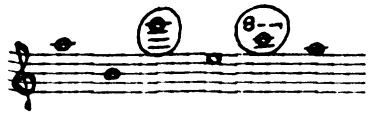
C G D A

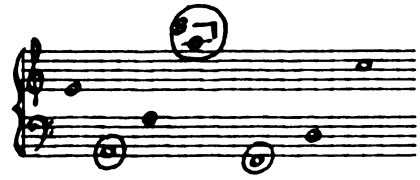
12.
Let us now review the practical range of the viola, which is:

Circle those notes in the following group which are not within the range of the viola.

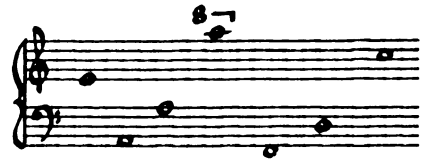


13.
Proceed as in Frame 12.





14.
Proceed as above.



15.
Notate the overall practical range of the viola.

a. A

b. G

c. II

d. IV

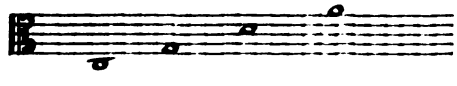
16.
As with the violin, Roman numerals are sometimes used to identify the strings of the viola.

a. I indicates the ____ string.

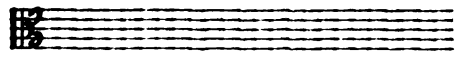
b. III indicates the _____ string.

c. The D string is indicated by a _____.

d. The C string is indicated by a _____.



17.
Notate, from lowest to highest, the pitches to which the strings of the viola are tuned.



False.

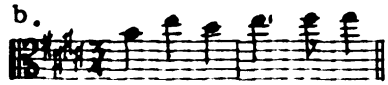
18.
In cases where the viola part goes unusually high and stays there for more than a few notes the treble clef may be used. For one or two notes, however, it is easier to read ledger lines than to adjust to a different clef.

The viola always uses the alto clef. (True/False) _____

Does the pa
ledger line
treble clef

(No respon

(Answer on

	19. A good rule to follow is: <u>Don't use the treble clef unless the part requires ledger lines in the treble clef</u>. In which example below should the treble clef be used? a.  b.  Answer: _____
a.	
Does the part require ledger lines in the treble clef?	20. What is a good question to ask yourself in deciding when to use the treble clef? _____ _____
(<u>No response necessary</u>.)	21. In comparison to the violin the viola has a more sombre, less brilliant sound. This is due to the fact that the instrument is somewhat larger and the strings and bow are slightly thicker than the violin.
(<u>Answer on next page</u>.)	22. As to timbre characteristics of the individual strings, the viola is somewhat less even in quality than the violin. The A string of the viola is generally more removed in timbre from the other strings than is the violin's E string from the other strings of that instrument. (<u>Continued on next page</u>.)

Penetrati

(Or equ

Th

The A string of the viola easily becomes penetrating and nasal as pitch rises. It may sound very much like an oboe.

What sound would you expect from the A string of the viola in its second octave?

_____

Penetrating, nasal.

(Or equivalent.)

23.

On many violas the A string becomes nasal as low as

.

Keeping this in mind circle the notes in the following group which might sound nasal on the A string.

24.

The D string is much more unobtrusive and gentle than the A string. Passages that would be too penetrating on the A string can often be played in better taste on the D string.

On what string would the following example be appropriate?

Answer: _____

The D string.

D (and

N

N

le

D (and) G.	25. The D and G strings both possess a good solid rich sound, the D string being more powerful than the D string of the violin. This sound often performs the important function of supporting and filling in the texture of the violins. Secondary melody and harmony parts would be well suited to the _____ and _____ strings of the viola.
No.	26. The C string is full and resonant like the violin's G string. Unlike the violin's G string, however, the D string of the viola becomes hoarse or choked sounding upward due to its greater thickness. Therefore it does not receive the type of melodic assignments common on the G string of the violin. Is the example below well suited to the viola's C string?  Answer: _____
No.	27. Is the C string frequently used for expressive melodic passages similar to those often played on the violin's G string? _____
less	28. Generally speaking the four strings of the viola are (more/less) _____ balanced in timbre than the strings of the violin.

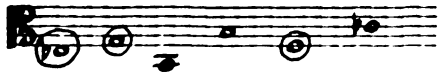
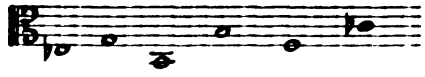
(No respo

F G

D E

D E

B C

(No response necessary.)	29. The general sound of the viola will vary with the type of strings used. Two common types currently used are wire wound over gut and all-wire wound strings. The all wire strings produce a more forceful sound.
	30. Position technique on the viola is identical to the violin with slight exception. Judging from what you know about the violin, circle those notes in the following group which are available in first position on the viola's C string. 
F G A B D E F G	31. What four letter names would be available in second position on the D string? ____ ____ ____ ____ In third position on the A string? ____ ____ ____ ____
D E F G B C D E	32. What letter names can be stopped in first position on the C string? ____ ____ ____ ____ In second position on the G string? ____ ____ ____ ____

33.
Circle the notes in the following example that would be considered beyond first position on the G string.

34.
Circle the notes in the following example that are beyond the third position on the A string.

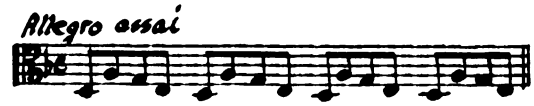
more

35.
An important factor concerning position technique on the viola is that the slightly greater length of the strings places the notes (ie. the fingers of the left hand) farther apart.

This makes the use of extensions (more/less) _____ difficult than on the violin.

Probably not.

36.
Could the following figuration be executed on the C string <u>at the tempo requested</u> without the use of extension?



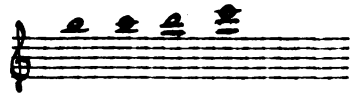
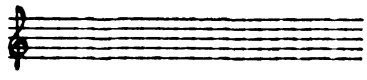
Answer: _____

37.
Spanning a P 5th in a low position is difficult for any violist who does not have large hands. Therefore, rapid accompaniment figures should be closely examined for "playability".

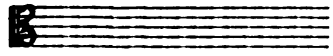
(Continued on next page.)

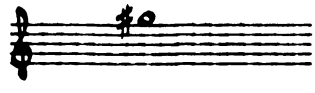
Extens
more d
lin, e
positi

(No

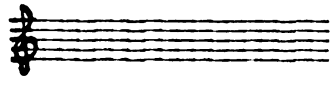
No.	The A in the figure above could be played on the G string in 1st position but moving over to that string and back is also hazardous in a fast tempo. Considering these two factors would you consider the example in Frame 36 good viola writing? _____
Extensions on the viola are more difficult than on violin, especially in the low positions.	38. What general statement can be made concerning the use of extensions on the viola? _____ _____
(No response necessary.)	39. Because of the fact that historically the violas were given a supporting role in orchestral music and due to a rather limited solo repertoire, violists, as a rule, are less proficient in high positions than violinists. (For reference one need only examine eighteenth century orchestral and chamber music to find entire compositions requiring only first position for the viola.) Eighth position is a practical limit for advanced players.
	40. Notate the four basic pitches available in eighth position on the viola's A string. 
eighth	41. A practical limit for advanced players is _____ position.

42.
A safe limit for high school violists is third position. What pitch does this indicate as the upper limit of range for high school violists? (excluding the use of extensions)





43.
Notate the highest pitch advisable for high school violists in terms of the treble clef.



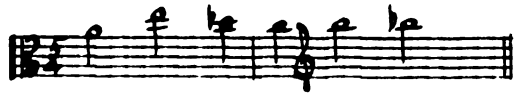
Third position.

44.
What position is a practical limit for high school violists?

_____

Fifth position.

45.
What is the highest position required to play the following passage on the A string?



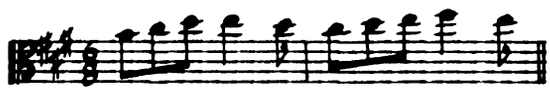
Answer: _____

No.

46.
Would the passage in Frame 45 be suitable for high school violists? _____

47. What is the highest position required to play the following passage assuming that it will be played on the A string?

Roman Carnival — Berlioz



Answer: _____

Second position.

48. Would the above example be within the range of high school violists? _____

Yes.

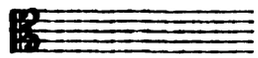
49. For which ability group, high school or professional, would the following example be appropriate? (Notice that it is marked to be played on the D string.)

Variations for Orchestra — Carter

Answer: _____

Professional.

50. What is the highest note one should expect high school violists to play?



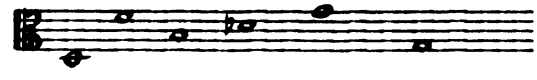
False.

51. Due to the greater distance between pitches, violists (particularly the less advanced) make greater use of the even numbered positions than do violinists. High school violists are more at home in second position than high school violinists.

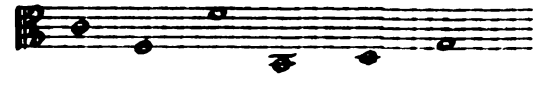
High school violists tend to avoid second position as do high school violinists. (True/False) _____

52. As in violin playing, one usually thinks of a given note as being played in the lowest possible position.

Circle those notes in the following group that would normally be played on the D string.



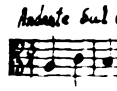
53. Circle those notes in the following group that would normally be played on the C string.

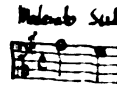


54. In discussing the violin we have seen that a given note is not always played in the lowest possible position for various reasons. This is equally true on the viola. One of these reasons is the impossibility of producing vibrato on an open string.

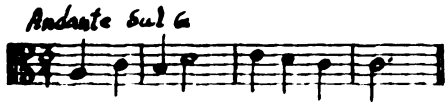
(Answer on next page.)

(Continued on next page.)

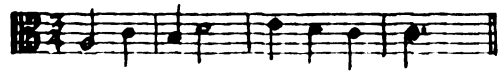


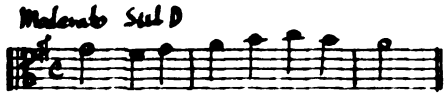


(No r

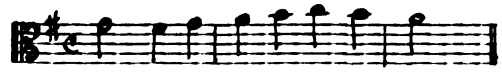


Using the recommended method, mark the following example so that those pitches possible on open strings will be played as stopped pitches on a lower string.





55.
Proceed as in Frame 54.



vibrato

56.
The markings used in the above frames compensate for the fact that _____ cannot be produced on an open string.

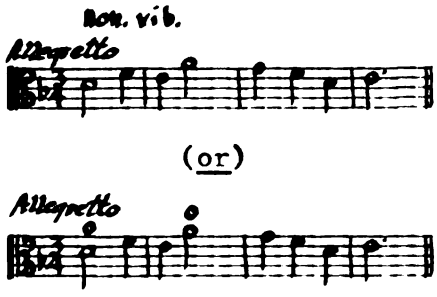
(No response necessary.)

57.
As you learned in the previous chapter, most performers will make the necessary adjustments in the situation described in the preceeding two frames. However, in the case of inexperienced players it would be wise to mark the parts.

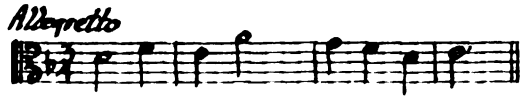
O

non vib.

58.
The possibility also exists of desiring that a note or passage be played without vibrato. Violists, like violinists habitually play all long notes with vibrato. You have learned in Chapter I that when no vibrato is desired on a pitch equivalent to one of the open strings it is marked either by placing a _____ above the note or by writing _____ over the note or passage.



59.
Mark the following passage so that the long notes possible on open strings will be played without vibrato.

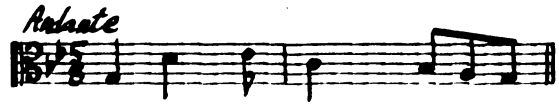


Write in non vib.

60.
Which of the above methods is usuable when stopped as well as open pitches are to be played without vibrato? _____

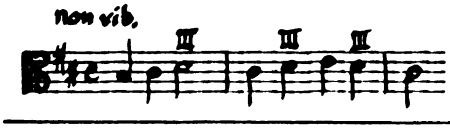
_____

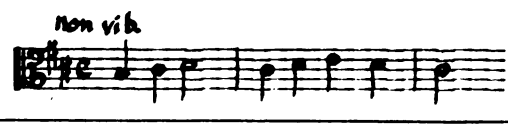
61.
Mark the following passage so that it will be played entirely without vibrato.



62.
Sometimes even in non-vibrato passages the sound of an open string will destroy the desired unity of timbre in a melodic passage. While not as noticeable on the viola as on the violin due to the more sombre general timbre of the viola, this factor should possibly be considered in solo passages. As in violin notation, Roman numerals may be used to show that an open string should not be used in a passage for the viola.

Mark the following passage to show that open strings are to be avoided.





63.
A simpler method in the case of passages that are generally diatonic is simply to mark the passage to be played entirely on a lower string so that all notes will be played stopped.

Mark the following passage using this method.

64.
It is important to remember that once a part is marked non vib. the players will continue to play in that manner until instructed differently. Therefore when using this effect, be sure to write "vibrato" or "vib." when you wish the players to return to that sound.

When vibrato is desired again after a non vibrato passage, the word _____ or the abbreviation _____ must be written above the passage at the point where the vibrato sound returns.

vibrato

vib.

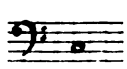
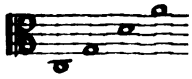
65.
Effects exploiting the timbre of a specific string are as foreign to the viola as they are characteristic of the violin. This is partially due to the supporting, as opposed to melodic, role to which the viola was relegated in traditional music.

Considering the statement above, one (would/would not) _____ expect to see many indications such as Sul D in viola parts.

would not

	66. One possible exception to the above practice concerns the A string which becomes nasal and penetrating as its pitch rises. What marking might be appropriate for the following passage especially in view of the dynamic marking? 
Sul D.	Answer: _____

SUMMARY

The practical range of the viola is three octaves plus a major third, from  to  . Viola notation uses the alto clef almost exclusively, and the four strings of the viola are tuned as follows:  . The four strings of the viola are less balanced in timbre than the violin and the general timbre of the instrument is mellow and sombre compared to the violin. The A string does become nasal and penetrating as its pitch rises.

The technique of playing the viola is identical to the violin except that the notes lie slightly farther apart due to the slightly greater length of the viola's strings. This fact also makes extensions more difficult on the viola than on the violin. Eighth position for advanced players and third position for high school violists are practical limits. Traditional music made little use of the higher positions on the viola because the instrument was usually relegated

to second

need for

As w

in the lo

this is n

violin no

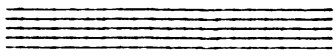
string is

musical s

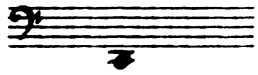
to secondary parts. More recent music has shown us that there is no need for this to be the case.

As with the violin, a given note for the viola is usually played in the lowest possible position. For reasons of uniformity of timbre this is not always true. In such cases the same markings used in violin notation apply. Exploitation of the timbre of a specific string is rather rare on the viola but may be used where a specific musical situation warrants it.

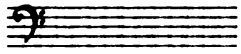
✓ c.	1. The second largest instrument of the string section is the violoncello. Commonly referred to as the cello, its foreign names are easy to recognize: violoncello (It.), violoncelle (Fr.), and Violoncell (Ger.). Place a check (✓) before the equivalent of cello in the following group. ____a. alto ____b. tenor ____c. violoncelle
✓ b.	2. Proceed as above. ____a. Violone ____b. Violoncell ____c. Geige
True.	3. The foreign names for the violoncello are practically identical with its English name. (True/False) _____.
cello	4. In English the violoncello is commonly called simply the _____.

✓ c.	5. The abbreviation for cello is Vc. from the complete name of the instrument. Place a check before the abbreviation for cello in the list below. ____a. Vln. ____b. D.B. ____c. Vc.
Vc.	6. The abbreviation for cello is ___.
	7. The cello is tuned to the same notes as the viola but an octave lower. Notate, from the lowest to highest, the four pitches to which the cello is tuned. 
a. G b. A c. IV d. II	8. As with the other stringed instruments, the four strings of the cello may be identified with numbers. a. III indicates the ____ string. b. I indicates the ____ string. c. The C string is indicated by a _____. d. The D string is indicated by a _____.

(Higher no
but impra



9.
From the tuning of the instrument we can ascertain the lowest possible pitch which is



(notate)

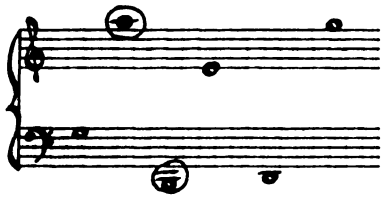
False.

(Higher notes are possible but impractical.)

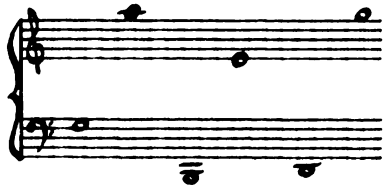
10.
The highest practical pitch on the cello is

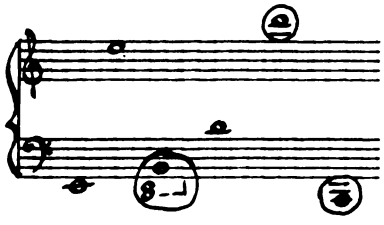
although higher pitches are possible.

is the highest note possible on the cello. (True/False) _____

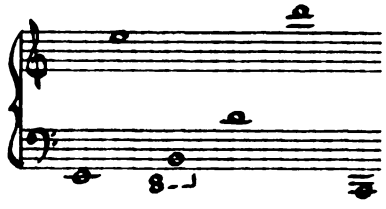


11.
Circle those pitches in the following group that are outside the practical range of the cello.

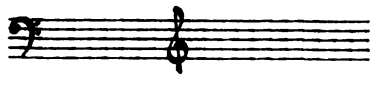




12.
Continue as in Frame 11.

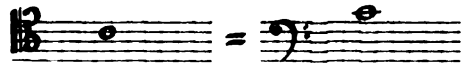


13.
Notate the overall practical range of the cello on the staff provided.



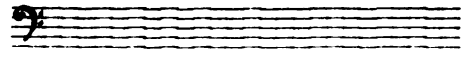
14.

Cello parts are written primarily in the bass clef. Because its range extends quite high above the bass staff, the tenor clef and (sometimes) the treble clef are also used. The tenor clef places middle C on the fourth line.



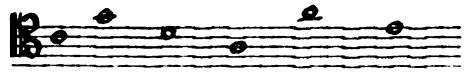
Give the bass clef equivalents of the following pitches.

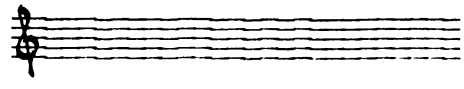
Answer:



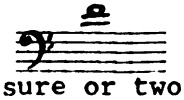
15.

Give the treble clef equivalents of the following pitches on the blank staff provided.



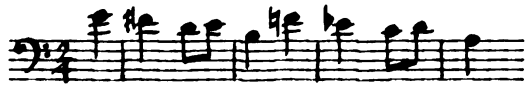


16.

The tenor clef should not be used unless the cello part stays above  for more than a measure or two.

In which of the following passages should the tenor clef be used?

Academic Festival Overture Brahms

a. 

(Answer on next page.)

(Continued on next page.)

Symphony No. 6 Tschaikovsky

b. 

b.

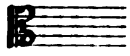
Answer: _____

17.

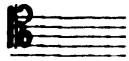
It is important not to confuse the tenor clef with the alto clef which is used for the viola but never for the cello.

Identify the clef signs below.

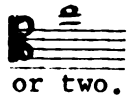
a. Alto clef.

a.  _____ (name)

b. Tenor clef.

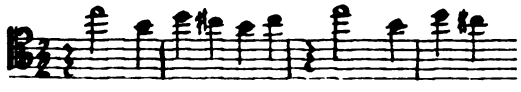
b.  _____ (name)

18.

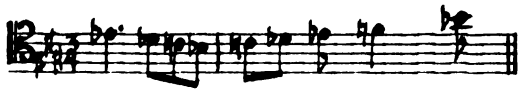
The treble clef is also used in cello parts though rather infrequently in traditional music. The treble clef should be used only when the part stays above  for more than a measure or two.

In which of the following examples should the treble clef be used?

Firebird Suite Stravinsky

a. 

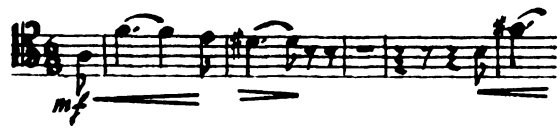
La Mer Debussy

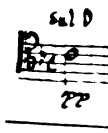
b. 

a.

Answer: _____

(No response necessary.)	19. An old and awkward tradition (found as recently as Tchaikovsky and Dvořák) regarding the use of the treble clef in cello parts was to write the part in the treble clef an octave higher than the desired pitch. This practice is no longer in use.
✓ c.	20. A more recent innovation regarding the use of the different clefs in cello notation is to ignore the tenor clef and use only the bass and treble clefs. The reason for this is that the tenor clef partially duplicates both the treble and bass clefs and its use only avoids one ledger line, the one on which middle C is placed on the great staff. This avoidance of the tenor clef is not universally accepted by cellists but is sufficiently used to warrant notice. When writing for a specific ensemble or cellist, consult the musician who will be reading the part and notate it according to his preference. A. In current practice often only the bass and treble clefs are used in cello notation. B. This avoidance of the tenor clef is not universally accepted by cellists. Place a check (✓) before the choice below which best evaluates the above statements. ____a. A is true. ____b. B is true. ____c. Both are true. ____d. Both are false.

False.	21. Cello parts should be written in the treble clef an octave higher than the desired sound. (True/ False) _____
bass tenor treble (Any order.)	22. An important factor to remember in regard to clefs is that one does not change clef for one or two notes or even for just one measure. Players would rather read a few ledger lines than change clef frequently. On the lines below list three clefs that may be used in cello notation. _____ _____ _____
A	23. The general timbre of the cello is warm and mellow but like the violin, it is extremely versatile where tone quality is concerned. The A string is singing and vibrant, even intense when necessary. The melodic use of the cello in this register is extensive, especially where vivid expression is desired. The following excerpt would be well suited to the _____ string. Tristan und Isolde, Prelude Wagner 



T

The G a

24.
The D string is also "warm" sounding and smoother and less nasal than the A string. Higher passages at a soft dynamic level might well be marked to be played on the D string.

Add the appropriate marking to the following passage.

25.
Which string, D or A, would be more appropriate for the following example?

Symphony No. 1 Sibelius

The A string.

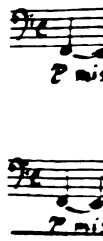
Answer: _____

26.
The two lowest strings, G and C, are very evenly matched in timbre. Both are dark and rich in overtones. Both are appropriate for full melodic passages or the dark foreboding sound often given the cellos.

What strings are suitable for the following passage?

The G and C strings.

Answer: _____



In the

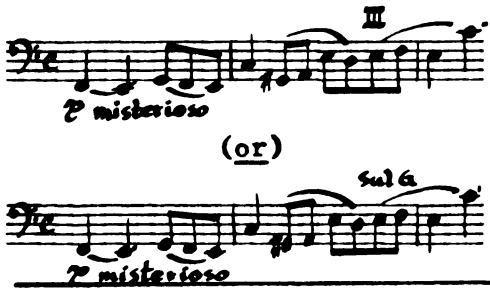
a. warm

b. warm,
than

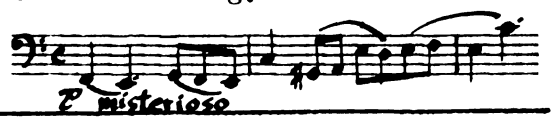
c. dark,

d. dark,

(Accura
acceptat



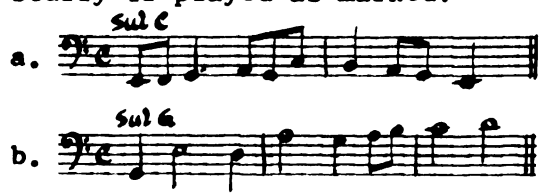
27. Apply the necessary marking to the example used in Frame 26 to prevent the cellos from crossing over to the brighter D string when the part enters the range of that string.



b.

28. Due to the greater thickness of the G and C strings they will tend to sound "stuffy" and weak when their sounding length is shortened in the second octave above the open pitch.

Which passage below might sound stuffy if played as marked?



Answer: _____

In their second octave.

29. At what point above their open pitch do the C and G strings begin to sound stuffy and weak? __
_____

a. warm, intense, singing

b. warm, smoother, less nasal than A string.

c. dark, rich in overtones

d. dark, rich in overtones

(Accurate synonyms are acceptable.)

30. List the timbre characteristics of the four strings of the cello.

a. A string _____
_____

b. D string _____
_____

c. G string _____
_____

c. C string _____
_____

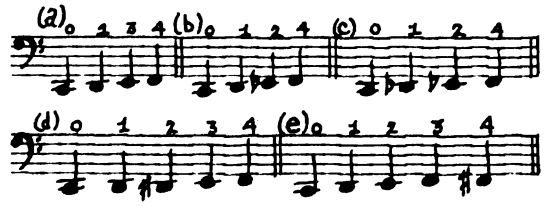
A minor third.	31. Position technique on the cello varies significantly from the viola and violin due to the considerable greater length of the strings. Understandably the notes lie farther apart on the fingerboard. The normal span of the hand encompasses only a minor third. A major third is a practical limit for the extensions up or down. What interval does the normal hand position cover in the first position on the cello? _____
A major third.	32. What interval is practical with extensions up or down? _____
(No response necessary.)	33. The interval which the normal hand position can span becomes larger, of course, in the higher positions as on the other stringed instruments.
More often.	34. Considering the smaller interval spanned by the hand on the cello would you expect a cellist to shift more or less often than a violinist? _____
less	35. The necessity of more shifts coupled with a larger instrument and a shorter and heavier bow would tend to make the cello (more/less) _____ agile than the violin.

(No

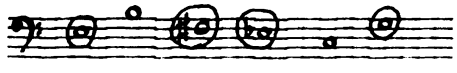
(No response necessary.)

36.

Usually only three fingers are used in a given position unless a chromatic passage is being played. Study the following examples involving first position on the C string.



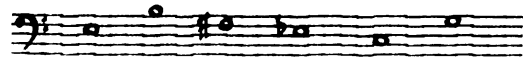
Examples (c) and (e) above would be considered an extension of the second finger. (Normally a whole step is played 1-3.)

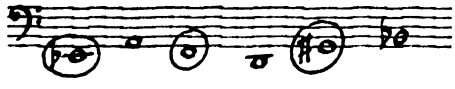


37.

It will be sufficient to remember that the practical maximum span from first to fourth finger is a major third anywhere below fifth position. The numbering of the positions is based on the same letter-name relationship to the open string as on the violin and viola.

Circle those notes in the following group that are available in first position on the D string.





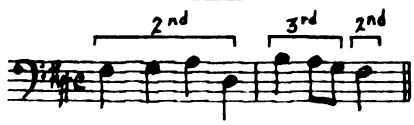
38.

Circle the notes below that are available in second position on the C string.

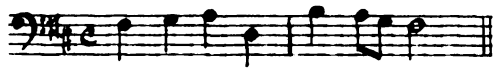
39.

Circle the notes below that can be played in third position on the A string.

Second (and) third.

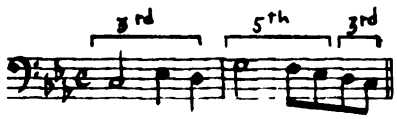


40.
What positions would be required to play the following example on the D string?



Answer: _____ and _____.

Third (and) fifth.



41.
What positions would be required to play the following example on the G string?

Answer: _____ and _____.

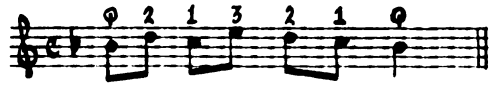
(No response necessary.)

42.
As with the viola, the even numbered positions on the cello are not avoided by less advanced players as they often are on the violin. Cellists are just as proficient in second and fourth position as they are in first, third, and fifth.

43.
Another difference in left hand technique on the cello is the use of the thumb. Because the instrument can be supported by the floor and the player's knees, the left hand need not help to support the instrument and can move more freely than on the violin or viola. When the left hand is in seventh position the body of the cello forces the thumb to leave its position behind the neck of the instrument. The side of the thumb may then be used to stop the strings, thus increasing the span of the hand. This is called a thumb position.

(Answer on next page.)

(Continued on next page.)

True.	Thumb positions normally occur in seventh position or above. (True/False) _____
It increases it.	44. How does the thumb position alter the interval that the left hand can span? _____
Two.	45. The symbol indicating the use of the thumb is 𝄐. How many times is the use of the thumb called for in the following passage in which the fingering has been indicated?  Answer: _____
The thumb.	46. In indicating cello fingerings which finger does 𝄐 indicate? _____
✓c.	47. The thumb can also be used below the seventh position but is not employed in this area as often as in the higher positions. Thumb position should be expected only from advanced players. A. The thumb position is possible in any area of the fingerboard. B. Cellists of any ability are capable of using thumb position. Check the choice below which best evaluates the above statements. ____a. Both are true. ____b. Both are false. ____c. A is true. ____d. B is true.

No.

48. As you can see, the thumb position is a great aid in playing passages which incorporate wide skips. One must take care, however, to allow sufficient time for the cellist to move the thumb from behind the neck of the cello to a position on the fingerboard.

Would it be wise to include a skip requiring thumb position in a rapid and otherwise diatonic passage? _____

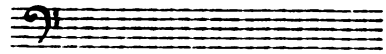
Yes.

49. As with the other stringed instruments some limitations must be set for players of various abilities. The overall practical range of the cello expressed at the beginning of this chapter indicates that tenth position on the A string can be expected from advanced players. Would tenth position normally be considered one of the thumb positions? _____

No.

50. Positions above sixth are not as common on the three lower strings, especially the G and C strings, as they tend to sound stuffy in high positions, but may be called for in difficult orchestral and solo writing or for special effects. Would you expect a cellist to be as proficient in tenth position on the G string as on the A string? _____

51. A safe limit for high school cellists is fourth position. Excluding the use of extensions, what high-note limit would this set on the A string?



It is
(o

It is an octave lower.
(Or equivalent.)

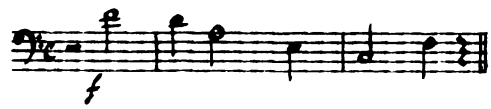
52.
How does this limit compare to the upper limit of the general practical range of the cello?

_____

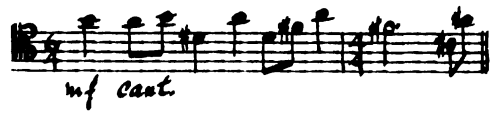
a.

53.
Considering the limitations expressed above, which example below would be suitable for high school cellists?

Third Symphony Harris

a. 

Rite of Spring Stravinsky

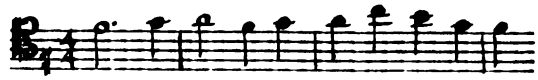
b. 

Answer: _____

Professional.

54.
For what ability group, high school or professional, would the following excerpt be appropriate?

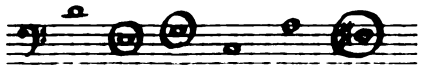
Symphony No. 4 Mahler



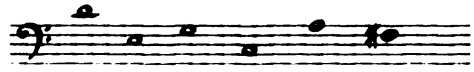
Answer: _____

55.
Circle those notes in the following excerpt which would be beyond the normal limit for high school cellists.

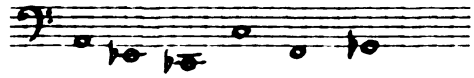
Symphony No. 5 Shostakovich



56. As with the other stringed instruments, one usually thinks of a given note for the cello as being played in the lowest possible position. Circle those notes in the following group that would probably be played on the D string.



57. Circle the notes below that would normally be played on the C string.



58. For reasons of technical impossibility and uniformity of timbre, a given note is not always played on the open string immediately below it. You have encountered some reasons for this in the previous chapters of this book.

List four reasons for not playing a note on the "usual" string.

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

a. It is impossible to produce <u>vibrato</u> on an open string.

b. The "clear" sound of an open string may destroy uniformity of timbre.

c. One may wish to expliot the unique timbre of a specific string.

d. Awkward shifts can be avoided.

(<u>Any order.</u>)

(No response necessary.)

59. As the various ways of indicating that a note is not to be played on the "usual" string have already been studied in connection with the violin and viola, further drill would seem redundant. It will be sufficient to remember that the same procedures apply to the cello.

Stuffy, ineffective

(Or equivalent.)

60. The idea of exploiting the unique timbre of a specific string on the cello does deserve special mention. The timbre of the G and C strings when played in their second octave has already been discussed.

How would you describe the sound of these strings in their upper register? _____

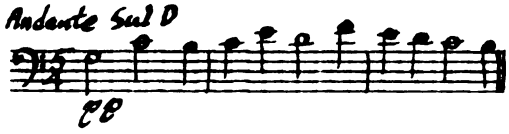
No.

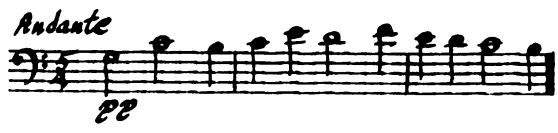
61. Would you expect to see many markings such as Sul G or Sul C in cello literature? _____

---

62. While the C and G strings are not used much in their upper registers, the second octave of the D string is often preferred over the more nasal A string.

Add the appropriate marking to the following example.





Because of the pianissimo dynamic level.

63. Why would the above example probably not sound good on the A string? _____

The fo

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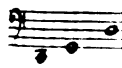
octave lowe



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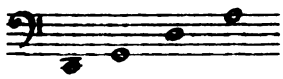
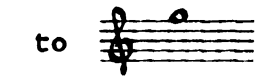
SUMMARY

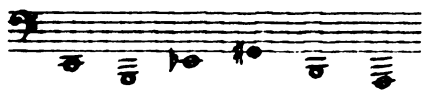
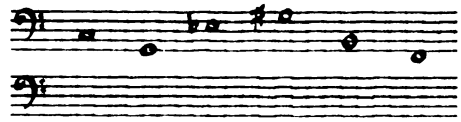
The four strings of the cello are tuned to the same letter names as the four strings of the viola. The actual pitches, however, are an octave lower in the case of the cello. These pitches are as follows:  . The practical range of the cello is three octaves plus a perfect fifth or from  to  . Cello notation uses primarily the bass clef but the tenor and treble clefs are also used for high passages.

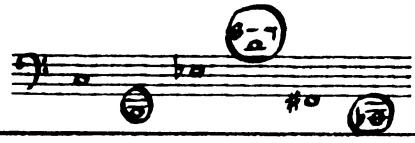
The general timbre of the cello is warm and mellow. The A string is singing and vibrant while the D string has a warm and less nasal sound. The G and C strings are quite evenly matched, both being dark and rich in overtones. These two lowest strings tend to become stuffy and ineffective in their upper two-thirds.

The left-hand technique on the cello differs significantly from the violin and viola due to the considerably greater length of the strings. The normal hand position on the cello encompasses only a minor third as opposed to a perfect fifth on the violin. Another major difference in cello technique is that the thumb of the left hand may be used on the fingerboard. Tenth position on the A string is a practical limit for advanced players and fourth position is safe for most high school cellists. This would limit the high note for high school cello parts to  .

The choice of string on which a given note is to be played follows the same normal procedures and exceptions as on the other stringed instruments. Exploitation of the unique timbre of a specific string is less common on the cello than on the violin but may be used if specific musical considerations require it.

	1. The largest of the stringed instruments is the double bass, often referred to simply as the bass. The three common foreign names for the double bass are very similar: contrabasso (It.), contre basse (Fr.), and Kontrabass (Ger.). Place a check (✓) before the equivalent of double bass in the list below. ____a. Kontrafagott ____b. Kontrabass ____c. Bratsche
✓ b.	
	2. Proceed as above. ____a. alto ____b. violoncello ____c. contre basse
✓ c.	
	3. The English equivalent of contrabasso is _____ _____.
double bass	
	4. The double bass is often referred to simply as the _____.
bass	
	5. The abbreviation for double bass is D.B. Place a check before the abbreviation for double bass in the list below. ____a. Vc. ____b. Vln. ____c. D.B.
✓ c.	

D.B.	6. The abbreviation for double bass is _____.
	7. The double bass is the only stringed instrument which does not sound the same pitch that is written in the part. In other words, it is a transposing instrument. Double bass parts are written an octave higher than the sound desired. Notate the sounding pitch on the double bass for the following written notes on the staff provided. 
True.	8. The double bass is a transposing instrument. (True/False) _____.
one octave	9. The sounding pitch of the double bass is _____ below the written pitch.
(1)edger (1)ines	10. The reason for this transposed notation is the normal sounding range of the instrument which is  . If the double bass parts were notated at the sounding pitch an abundance of 1 _ _ _ _ _ 1 _ _ _ _ would be required.

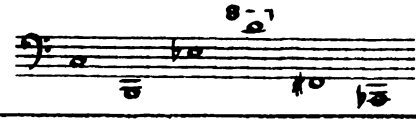


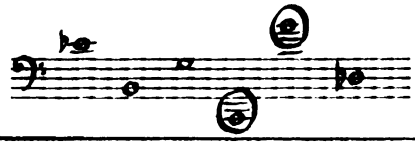
11.

Let us now review the normal range of the double bass in terms of written pitch (as it is usually considered.) The normal written range of the double bass is

.

Circle those notes in the following group that are not within the normal written range of the double bass.



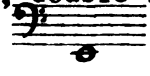
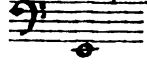


12.

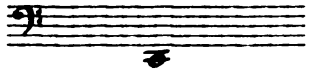
Proceed as in Frame 11.

(No response necessary.)

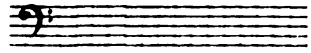
13.

So far only the normal range of the double bass has been discussed. It is important to realize that as far back as Beethoven, double bass parts extending below  were being written. The poor substitute of simply playing pitches below  an octave higher was in vogue for many years. When higher performance standards and more significant double bass parts demanded that the actual pitch be sounded, changes in instrument construction became necessary. The five-string double bass (limited primarily to Europe) and the four-string instrument with an extension of the finger board for the fourth string (the type most used in America) extended the range of the double bass down to  .

14. Circle the notes in the group below that are not possible on a double bass with an extension.

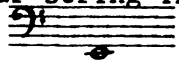


15. Notate the lowest written pitch possible on a double bass with an extension.

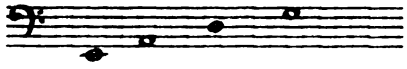


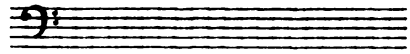
perfect fifth.

16. The tuning of the double bass also differs from the tuning of the other stringed instructments. The interval between the open strings of the cello, viola, and violin is a _____.

17. The interval between the open strings on the double bass is a perfect fourth. The lowest string (on a four-string instrument) is tuned to  (written pitch)

On the staff provided notate the written pitches to which the four strings are tuned.





a. II

b. III

c. G

d. E

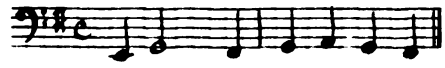
18. The numerical identification of the strings is the same as for the other stringed instruments, IV being the lowest string.

a. The D string is identified by a _____.

b. The A string is identified by a _____.

c. I identifies the _____ string.

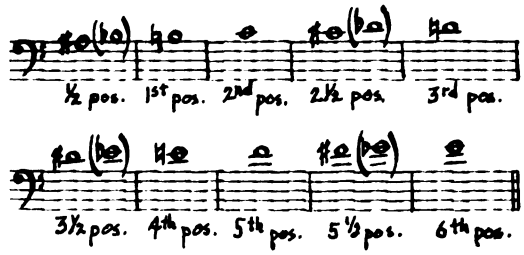
d. IV identifies the _____ string.

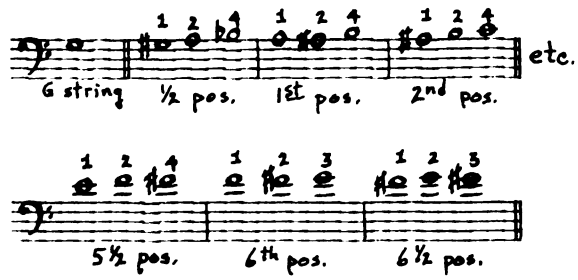
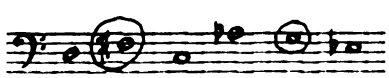
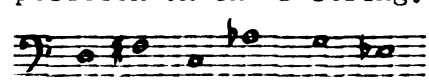
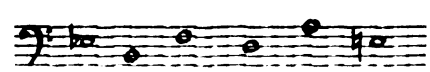
(No response necessary.)	19. The double bass is notated primarily in the bass clef. The tenor and treble clefs are also found in double bass parts but less frequently than the bass clef.
Dark, ominous. (Or equivalent.)	20. The general timbre of the double bass is deep and rather ominous in its lower octave. Some listeners find it difficult to hear the "center" of a low pitch on the double bass. The sound becomes clearer and "more centered" as pitch rises. In traditional music, the basses are often doubled by the cellos an octave higher for greater clarity. What sound would you expect from the double basses in the following passage?  Answer: _____
No.	21. Because the double bass serves primarily a supporting function in traditional music, effects exploiting the timbre of a specific string may generally be said to be foreign to the instrument. Would you expect to see many indications such as Sul D in double bass parts? _____

[redacted]

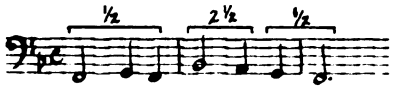
No
or

A major second.	22. You may remember that on the cello the normal span of the left hand covered fewer pitches than on the violin or viola due to the greater length of the strings. On the double bass, the interval that the left hand can span is even smaller. In first through sixth position, the normal span of the left hand from first to fourth finger is only a major second. What interval can be spanned by the normal left-hand position in first through sixth position? _____
More shifts are necessary on the double bass.	23. How would you compare the number of shifts required on the double bass with the violin? _____ _____
No.	24. Judging from the deduction made in the preceeding frame, do you think that rapid, scale-wise passages are idiomatic on the double bass? ____
(Answer on next page.)	25. The greater distance between "stopping points" on the double bass requires considerable use of the half positions which are used to some degree on the smaller stringed instruments, specifically the viola and cello. So far we have considered position in terms of the letter name stopped by the fourth finger regardless of the accidental applied to it. On the double bass, the accidental makes a difference. Study the following example concerning the fourth finger on the G string of the double bass. (Continued on next page.)

(No response necessary.)	
B C or D .	26. What note does the fourth finger stop in first position on the G string? _____ In 2½ position? _____
D	27. By transposing the identifying pitches on the G string downward by perfect fourths, the pitch locations of the positions on the other three strings can be found. On what pitch is the fourth finger placed in third position on the G string? _____
D	28. What pitch does the fourth finger stop in second position on the D string? _____
fourth.	29. Notice that there is no 1½ position and no 4½ position. The whole numbered positions <u>on the G string</u> place the fourth finger on natural notes. The half positions <u>on the G string</u> place the fourth finger on sharped or flatted notes. Positions on the E, A, and D strings are located by transposing the pitches on the G string down a perfect _____
There is no 1½ position on any string.	30. What pitch does the fourth finger stop in 1½ position on the E string? _____

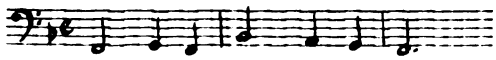
(No response necessary.)	31. Fingering on the double bass also differs from the other stringed instruments. The third finger is not used by itself below sixth position but is placed right behind the fourth finger. At the sixth position, the third finger replaces the fourth finger. Study the following example. 
A major second.	32. What interval is spanned by the hand through 6½ position? _____ _____.
Sixth position.	33. In what position does the third finger replace the fourth finger? _____.
A major second.	34. What interval can be spanned by the left hand in sixth position? _____.
	35. Circle those notes in the group below that <u>can</u> be played in second position on the D string. 
	36. Circle those notes in the following group that <u>can</u> be played in 3½ position on the A string. 

First,

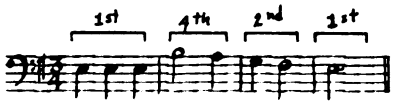


½ (and) 2½

37.
What two positions can be used to play the following example on the E string?

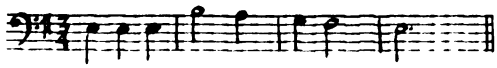


Answer: _____ and _____



First, fourth, (and) second.

38.
What positions are suggested to play the following passage on the D string?



Answer: _____, _____ and _____

one octave

39.
The thumb is also used on the double bass as it is on the cello. The first thumb position on the double bass is one octave above the open string, although the thumb may be used in lower positions if necessary.

The thumb positions on the double bass normally begin _____ above the open string.

less

40.
Thumb position on the G string begins a perfect fourth below the upper range limit of the instrument. With this in mind, one would expect the use of the thumb on the double bass to be (more/less) _____ frequent than on the cello.

No.

41. In view of the factors discussed thus far, would you consider the double bass to be a very agile instrument in comparison to the other members of the string section? _____.

b.

42. This problem of agility is a good point with which to begin a discussion of the limitations concerning the double bass. Rapid running passages are possible if well written but should be kept reasonably short for best results.

Which example below would you consider more playable on the double bass?

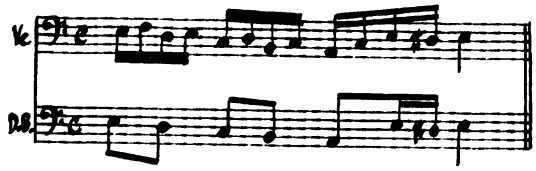
a. 

b. 

Answer: _____

(No response necessary.)

43. This point must be considered when the basses are doubled by the cellos as they often are in traditional music. Study the following situation.

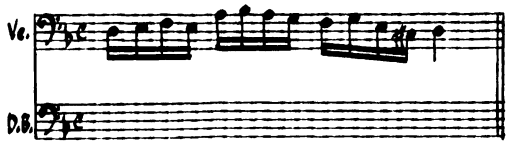


As you can see, the basses were given a simplified version of the cello part which can be played more cleanly. Notice that it is the non-essential notes of the cello part which are left out and the descending scalewise motion of the line which is preserved.

(The C♯ is optional.)

44.

Write a suitable double bass part which essentially doubles the cello part given below.

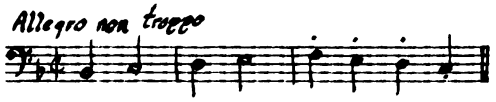


45.

Could the double basses be expected to play the same written part as the cellos in the example below?

Yes.

Tragic Overture Brahms

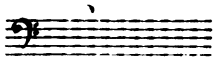


Answer: _____

46.

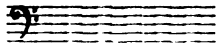
Aside from the general limitations of the instrument, some limitations must be set for players of different abilities. A very important point is the lower range limit of the double bass. Very few, if any, high school orchestras own a double bass with a "low C" extension.

In view of this fact what would be the lowest practical pitch for high school double bass parts?



47.
Most professional orchestras, however, have at least part of their double bass section equipped with extensions.

Notate the lowest possible written pitch for a professional double bass section.



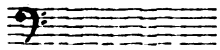
48.
For which ability group, high school or professional, is the following passage appropriate?

Symphony No. 4 Hanson

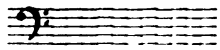
Professional.

Answer: _____.

49.
The highest position generally practical for high school double bass players is sixth position. What high-note limit does this indicate on the G string?



50.
What is the upper limit of the general practical range expressed at the beginning of this chapter?



perfect fourth

51. The pitch shown in Frame 50 is, of course, the practical limit for advanced players.

The upper range limit for high school performers is a _____ _____ (interval) lower than for professionals.

Professional.

52. For which ability group is the following passage suitable?

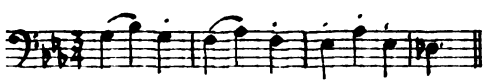
Symphony No. 5 Shostakovich

Answer: _____

Yes.

53. As far as range is concerned, is the following example appropriate for a high school double bass section?

Symphony No. 3 Beethoven



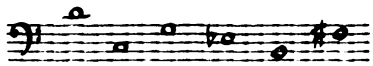
Answer: _____

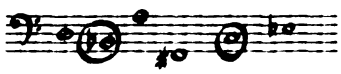
54. Circle those notes in the following example that are beyond the practical range of high school double bass players.

Symphony No. 3 Riegger

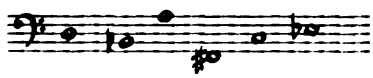
55. As on the other stringed instruments, a given note is usually played in the lowest possible position.

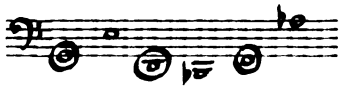
Circle those notes in the following group that would normally be played on the D string.





56. Circle those notes in the following group that would usually be played on the A string.





57. Circle those notes below that would normally be played on the E string on a double bass with an extension.

a. It is impossible to produce vibrato on an open string.

b. The "clear" sound of an open string may destroy uniformity of timbre.

c. One may desire to exploit the unique timbre of a specific string.

d. Awkward shifts can often be avoided.

(Any order.)

58. The above practice is not always observed for various reasons. List four reasons for not playing a given note on the "usual" string.

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

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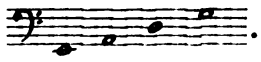
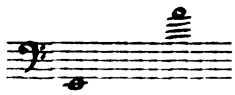
(No response necessary.)	59. The exploitation of the timbre of a specific string is seldom used on the double bass because the general timbre of the instrument is quite uniform. This does not mean that it should not be used. One may find the "thick" sound of the E and A strings in their upper register quite appropriate for specific effects. In this case the orchestrator is advised to experiment with the instrument before making up his mind.

SUMMARY

The double bass is the only transposing instrument of the string section. It is notated one octave higher than the desired sound. The double bass is tuned in fourths rather than in fifths and the written pitches of the open strings are  . The practical range of the double bass is  but instruments with an extension can play down to  . Double bass notation uses the bass clef almost exclusively but may use the tenor or treble clef for extremely high passages. The general timbre of the double bass is deep and ominous and one may experience difficulty in hearing the "center" of the low pitches on the instrument.

The left hand technique on the double bass differs greatly from the other stringed instruments in that only a major second can be spanned by the hand below sixth position due to the much greater length of the strings. The double bass also makes extensive

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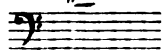
use of the half positions. As on the cello, the thumb of the left hand is used in the extreme high positions. The practical range of the instrument takes advanced players into the thumb position but sixth position is a practical limit for high school performers. This would limit the high note for high school players to  .

The choice of string for a given note follows the same normal procedure and exceptions as the other stringed instruments. Exploitation of the unique timbre of a specific string is seldom used on the double bass but might be appropriate when the "thick" sound of the lower strings is desired.

In writing for the double bass one should remember that its size and technique make it the least agile member of the string section.

(b)owing

1. The usual manner of producing a sound on the violin, viola, cello and double bass is to cause the strings to vibrate by drawing the bow across the strings, or, in other words, by bowing. In orchestration we must define bowing more specifically in terms of the direction in which the bow moves and in terms of the weight and speed with which the bow engages the strings. Sometimes the choice of bowing is left up to the performers but more often the bowing is indicated in the score and parts. A composer or orchestrator must be able to mark the score and parts so that the desired sound will be produced.

   The act of marking a part to show how it is to be bowed is called b _ _ _ _ _ the part.

---

up(bow)

2. The two most elementary bowing indications are those which indicate the direction in which the bow is to move. The bow is drawn across the strings in either an upward (from point to frog) or downward (frog to point) direction.

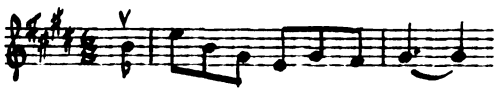
   Drawing the bow downward is called downbow. Drawing the bow upward then is called __bow.

---

upbow

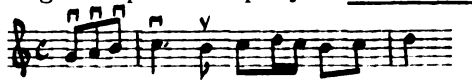
3. The indication for downbow is ⊓ and the marking for upbow is V .

   The first note in the example below would be played _____.



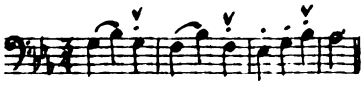
downbow.

4. The first four notes of the following example are played _____

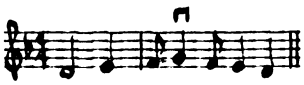


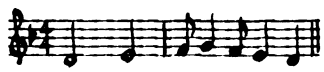
5. Mark the cello part below so that the third beat of each measure is played upbow.

Symphony No. 3 Beethoven



6. Mark the following violin part to show that the G in the second measure is to be played downbow.





7. Very often two or more notes are played without a change of bow direction. In string notation a slur mark usually means that the group of notes to which the slur applies are played without a change of bow direction or, to use a string players' expression, "on one bow".

In the following example the four eighth notes at the beginning are all played on one upbow. The two quarter notes are then on one downbow.

In other words the bow changes direction once in this example.

(Answer on next page.)

(Continued on next page.)

How many times does the bow change direction in the following example?

Symphony No. 4 Piston

Answer: _____

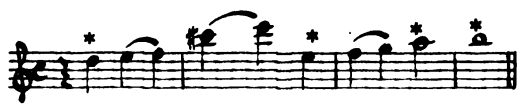
Twice.

8.
Mark the following example to show that pairs of sixteenth notes are to be played on one bow.

Faust Symphony Liszt

9.
Notes not included in a slur require a change of bow direction.

Symphony No. 4 Hanson



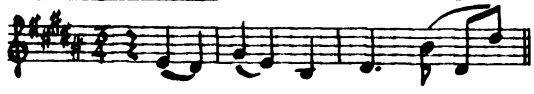
The asterisks in the above example indicate single notes that are played "on separate bows".

How many times does the bow change direction in the above example?
_____ times.

Six

10.
How many times does the bow change direction in the following example?

Third Symphony Copland

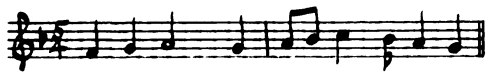


Answer: _____ times.

Four

None.

11. What marking is necessary to show that each note in the following example is to be played on a separate bow?



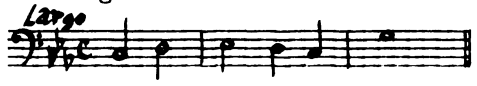
Answer: _____

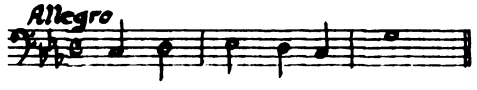
---

a.

12. In marking bowing slurs one must be careful to use an equal amount of bow in both directions. Tempo and dynamics must always be considered. At a slow tempo the actual duration of a note is greater than for the same note at a faster tempo. Hence more bow will be used at a slower tempo and more changes of bow direction will be necessary.

Which example below will require more changes of bow direction?

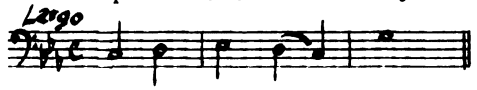
a. 

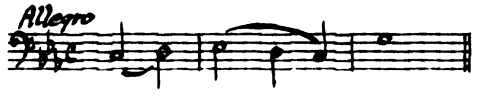
b. 

Answer: _____

(Answer on next page.)

13. A balanced bowing for each of the above examples is shown below.

a. 

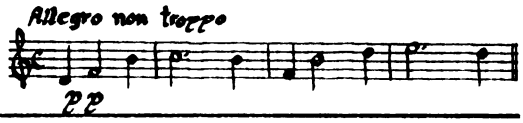
b. 

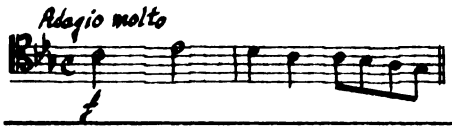
(Continued on next page.)

(No

Indicate a balanced bowing for the following example.

Leonore Overture No. 3 Beethoven



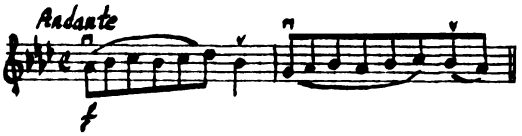


14. Proceed as in Frame 13.

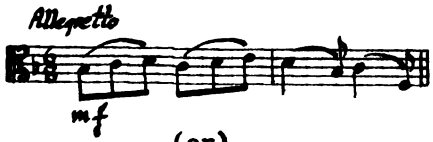
(No response necessary.)

15. In addition to tempo the relationship between dynamics and bow speed is also very important. At a constant dynamic level the bow speed will generally remain constant. Therefore an equal number of beats played in each direction is usually best. The following example illustrates a balanced bowing in terms of tempo and dynamics.

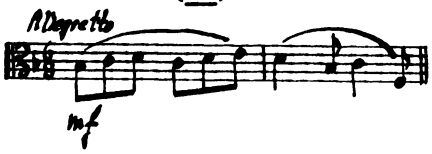
16. The bowing indicated in the next example is not at all balanced. The player would probably "run out" of downbow in the second measure.

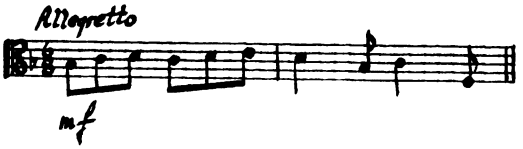


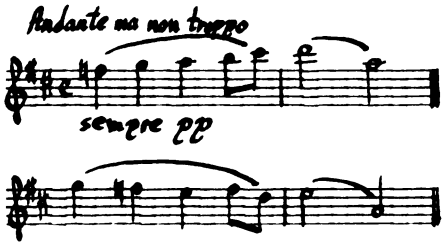
Add bowing slurs to the following example that will indicate a balanced bowing.



(or)

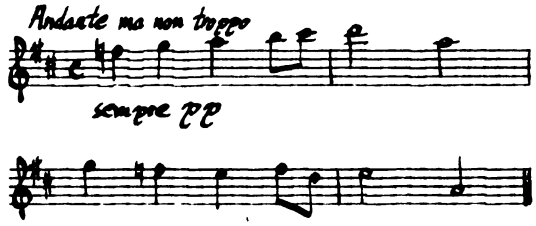






17.

Proceed as in Frame 16.



(No response necessary.)

18.

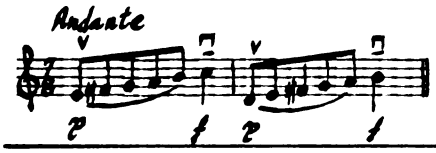
When the dynamic level is not constant, bow speed will vary accordingly. Players tend to use more bow for loud playing than in a pianissimo passage. By changing the dynamic markings in the poorly bowed example from Frame 16 the bowing can be made to work.

With the new dynamics the player could balance the amount of downbow used on the three pianissimo beats of each measure with an equal amount of upbow on the forte fourth beat.

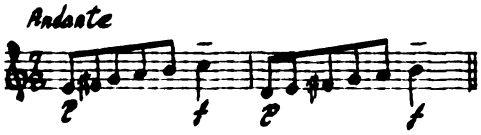
19.

Dynamics, of course, are never changed to accommodate poor bowings but bowings must agree with the dynamic markings in the music.

Add directional marks and slurs which indicate a balanced bowing for the following example. Begin downbow.



20.
Proceed as in Frame 19 but begin upbow.



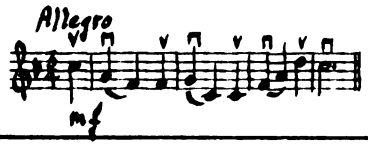
down(bow)

21.
Returning to the signs for upbow and downbow certain general principles regarding their use should be expressed, at least in terms of less subtle music. Metrical stresses (strong beats) or any accent are best achieved <u>downbow</u>.

From this one can deduce that the first beat of a measure is usually played _ _ _ _bow.

up(bow)

22.
From the above principle it follows that an anacrusis or upbeat is usually played _ _bow.



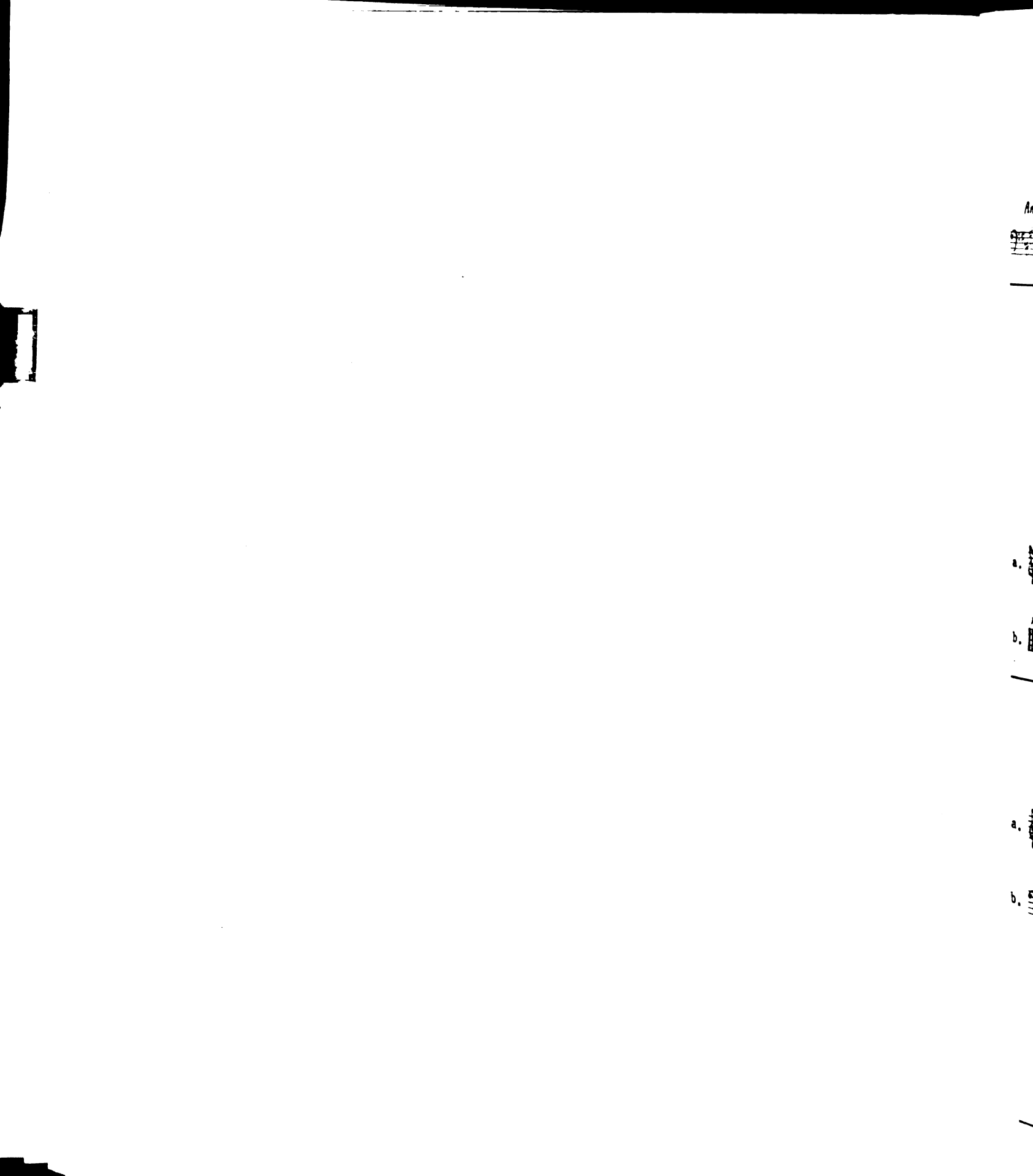
23.
Keeping the above principles in mind, add directional bowing indications to the following passage.

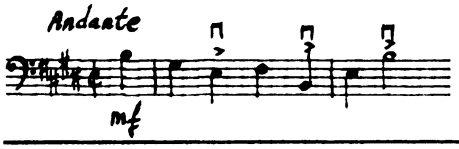
upbeat or anacrusis.

24.
The most obvious place to use an upbow is on an _____

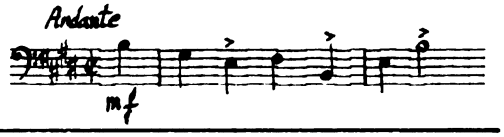
Accents.

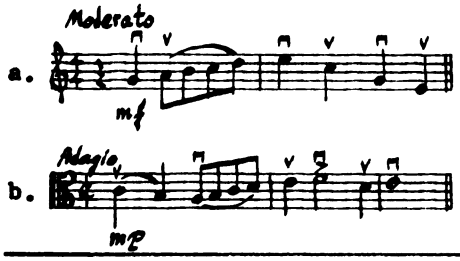
25.
For what purpose other than metrical stresses is a downbow usually used? _____





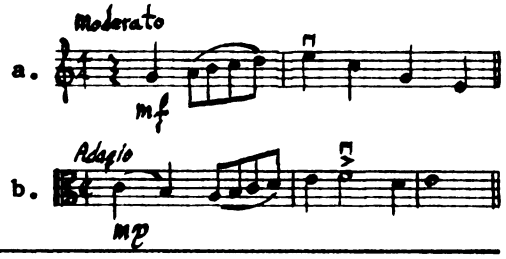
26. Place downbow indications over appropriate notes other than metrical stresses in the following example.

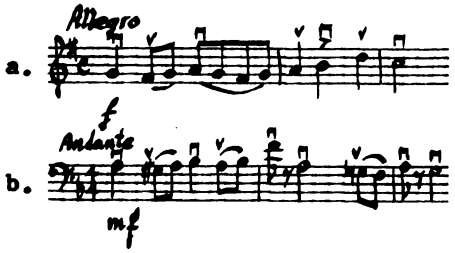




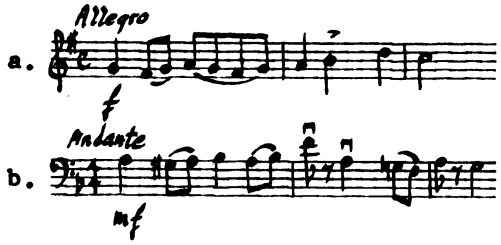
27. The most important aspect of bowing is planning ahead. A note several beats ahead may require a specific bowing and the orchestrator will have to satisfy its requirements first, then work backward.

Bow the following exercises working around the specific bowings given.





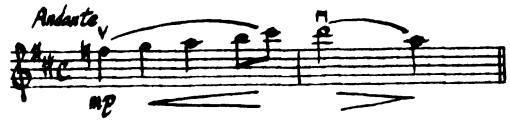
28. The following exercises contain notes which require specific bowings. Be sure to plan ahead in bowing them.



(No response necessary.)

29.

The upbow is often considered the "emotional" bow and short crescendi or other romantic nuances are usually played upbow. The following example illustrates this use of the upbow.



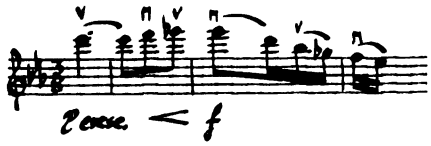
30.

Remember that this use of the upbow applies only to short crescendi. A long crescendo would require more than one bow and would be bowed according to considerations other than dynamics.

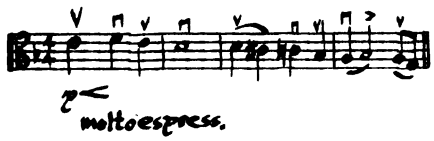
Indicate a "romantic" bowing for the following excerpts.

Violin Concerto, Op. 26. Bruch

a.

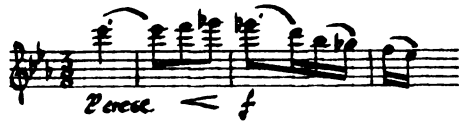


b.



Symphony No. 3 Mahler

a.

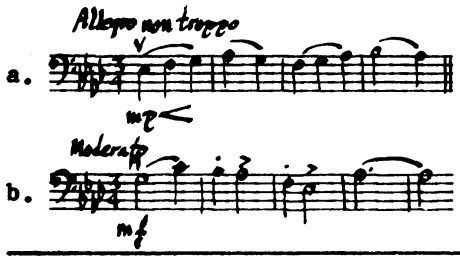


b.

31.

In actual music, of course, it is not necessary to place directional marks above every note. If the first notes of phrases and places where the player might have a choice are marked, the rest of the phrase will take care of itself.

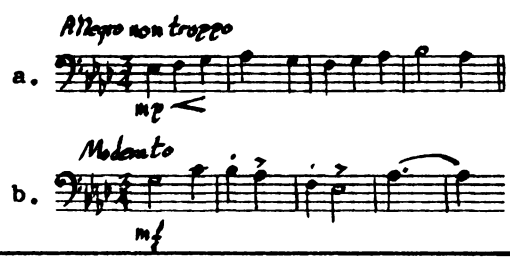
Place directional marks only where needed in the following example.



32.

Bowing slurs, of course, must always be indicated anytime that more than one note is to be played on one bow.

In the following phrases place directional marks only where necessary and add bowing slurs to provide a balanced bowing.



33.

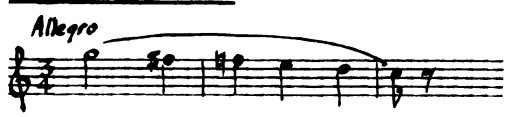
Bowing is without a doubt the most difficult aspect of the study of the stringed instruments. There may easily be as many opinions on how to bow a given piece or phrase as there are violinists to play it. In that portion of the orchestral literature which is played most often (classical and early romantic) certain bowings have become traditional in certain pieces but even in the "old standards" concert-

(Continued on next page.)

(Answer on next page.)

(No respo

(No respo

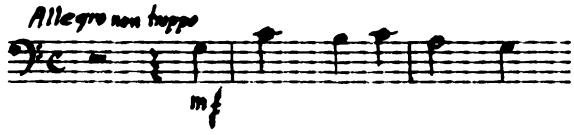
(No response necessary.)	masters sometimes disagree. The ultimate aim of bowing is to communicate accurately what is on the printed page and to this end all other considerations must remain secondary.
(No response necessary.)	34. In addition to the direction in which the bow moves and the number of notes taken on one bow, it is also necessary to consider more precise aspects of bowing dealing with the specific quality of sound, attack, or release. These aspects of bowing will be used to describe the various styles of bowing.
legato.	35. The first style of bowing to be considered is the legato style. This style of bowing is more or less synonymous with the bowing slur. If several notes are played without a change of bow direction, they will obviously be connected very smoothly. The style of bowing that is more or less synonymous with the bowing slur is called _____.
Legato.	36. What style of bowing would be used in the following example? Symphony No. 41 Mozart  Answer: _____.

37.

It is also possible to play in a legato style and still change bow direction on each note. In this case slurs are not used as slurs also indicate bowing. Simply write legato above the passage to be played in legato style.

Mark the following passage to be played in a legato style without changing the bowing.

Symphony No. 1 Brahms



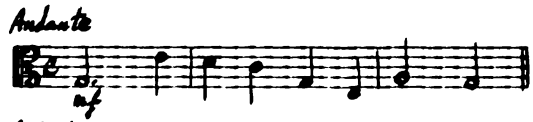
b.

38.

The word legato must be written above the part if that sound is desired on an unslurred passage. In the absence of slurs string performers will play non-legato unless instructed otherwise.

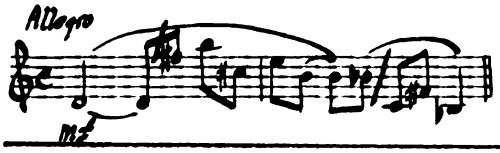
Which example below would be played legato?

a.



b.

Answer: _____.



39.

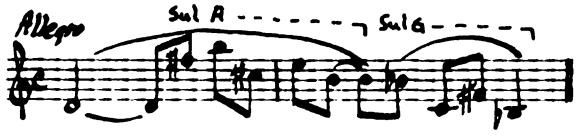
It is important to remember that consecutive notes on <u>non-adjacent strings</u> cannot be played in a perfect <u>legato</u> style because the bow must skip over the "unused" string.

In the following exercise draw a slash (/) between the notes that could not be connected in <u>legato</u> style assuming that each note is played in the lowest possible position.

A

40.

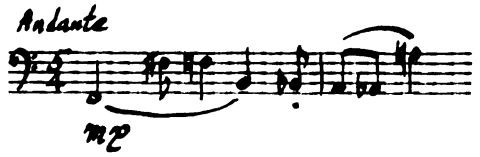
If such passages <u>must</u> be played <u>legato</u>, they must be marked to show that certain notes are to be played on a string other than the "customary" one or in other words so that the entire passage can be played on adjacent strings.

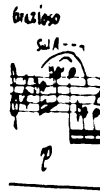


In the example above "Sul A" means that all of the notes under the broken line are to be played on the _____ string.

41.

Mark the following example so that the <u>legato</u> bowing can be executed as indicated.

Cello 



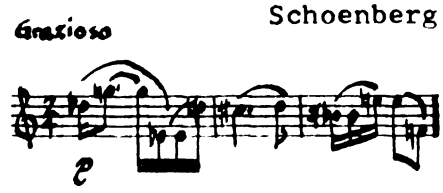
It is
but ea
a sepa

(Yo

42.
Proceed as above.

Variations for Orchestra

Schoenberg



Loure'.

43.
Loure' is a style of bowing very similar to legato in that several notes are played on one bow. It differs from legato in that each note is given a separate, subtle "push" even though the bow does not stop or change direction.

A type of legato in which each note receives a separate, subtle "push" without a change of bow direction is called _____

It is much like legato but each note receives a separate, subtle push.

(Your own words.)

44.
The notation for the loure' style of bowing is illustrated in the example below.

Symphony No. 2 Sebelius

Describe the sound produced by the loure' style of bowing in your own words._____

_____

_____

_____

45.

What style of bowing is called for in the following example?

Symphony No. 6 Tchaikovsky

Answer: _____

Louré.

46.

The louré style of bowing is often used to heighten expressiveness (or give a lingering effect) in legato passages. (Frequently a crescendo is also involved.) The slight "push" on each note gives a subtle emphasis that would be overdone if separate bows were used for each note.

Louré bowing is also useful when a subtle delineation of rhythm is desired on repeated notes while still retaining an overall legato effect.

Which use of louré bowing is demonstrated in the following example?

Symphony No. 2 Sebelius

Answer: _____

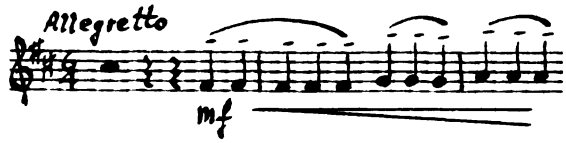
_____

_____

It is used here to heighten the expressiveness of a legato passage.

47. Which use of louré is demonstrated in the following passage?

Symphony No. 2 Sebelius



Answer: _____

Louré is used here for subtle delineation of rhythm on repeated notes while still retaining a legato effect.

48. List two reasons for using the louré style of bowing.

a. _____

a. To heighten the expressiveness (or give a "lingering" effect) in legato passages.

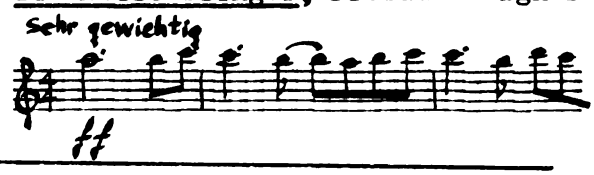
b. _____

b. For delineation of rhythm on repeated notes while still retaining a legato effect.

49. Mention has already been made of the non-legato style of bowing. This style of bowing is often simply called separate bows. In non-legato bowing the beginning of each note is slightly more obvious than in true legato but the notes are not separated or detached from one another. The bow remains on the string and does not stop when changing direction. Non-legato

(Answer on next page.)

(Continued on next page.)

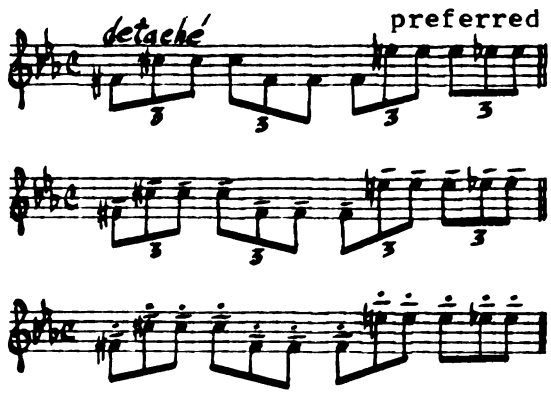
False.	is one of the most frequently used styles of bowing and can be executed at any tempo or dynamic level. In the <u>non-legato</u> style of bowing the notes are detached from one another. (True/False) _____.
True.	50. The <u>non-legato</u> bow does not stop when changing direction. (True/False) _____.
(<u>No response necessary</u>.)	51. <u>Non-legato</u> bowing is used when no bowing indications (slurs, dots, accents, etc.) are included in the music. The following excerpt is an example of a passage that would be played <u>non-legato</u>. <u>Die Meistersinger</u>, Prelude Wagner 
The beginning of each note is slightly more obvious than in true <u>legato</u> but the notes are not separated or detached from one another. (<u>Your own words</u>.)	52. Describe the sound of <u>non-legato</u> bowing. _____ _____ _____ _____
(de)tached	53. If each note of a passage is to be played with a separate bow and not in <u>legato</u> style the term <u>detaché</u> applies. As the sound of this French word implies, the notes are de_ _ _ _ _ _ from one another.

(No re

(No response necessary.)

54.

The detaché sound is achieved by emphasizing the change of bow direction by stopping the bow momentarily as it changes direction. The bow does not leave the string. Various degrees of detaché are possible depending upon the style and dynamic level of the music. Below are three ways to indicate detaché.

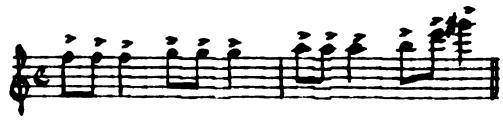


b.

55.

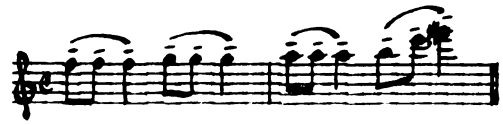
In which of the following examples is detaché bowing called for?

a.



b.

c.



Answer: _____

56.

The detaché style of bowing is appropriate whenever a slight separation between notes is desired. Many string players consider detaché and non-legato (separate bows) to be synonymous. Current thinking generally repudiates this opinion and considers detaché to be slightly more separated than simple non-legato. The important difference between detaché and non-legato is that in detaché the bow stops momentarily as it changes direction between notes, whereas in non-legato it does not.

A. Detaché is the same as non-legato.
B. In detaché the bow stops momentarily as it changes direction.

Check the choice below which best evaluates the above statements.

____a. A is true.
____b. B is true.
____c. Both are true.
____d. Both are false.

____b.

57.

Explain the difference between detaché and non-legato. _____

_____

_____

_____

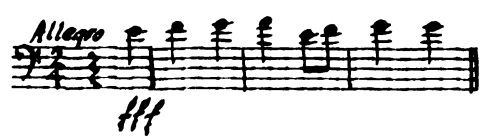
In detaché the bow stops momentarily between notes. In non-legato it does not. (Your own words.)

58.

Using the preferred method, mark the following passage to be played detaché.

Petrouchka — Stravinsky

Cello



louder

59.

Another detached but more forceful style of bowing is the marcato style. As in detaché the bow stays on the string in marcato bowing. The marcato bow stroke is begun more suddenly than detaché and the bow is pressed harder against the string.

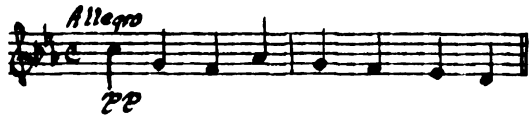
One may deduce that this pressure would cause dynamic level of marcato bowing to be generally (louder/softer) _____ than that of detaché.

b.

60.

For the above reason, the marcato style of bowing is reserved for loud passages or accents.

Which of the following examples is better suited to marcato bowing?

a. 

b. 

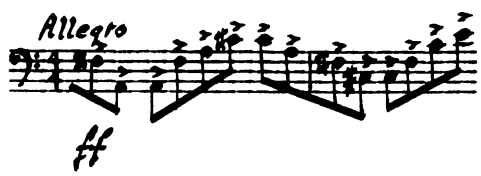
Answer: _____

(Answer on next page.)

61.

The notation for marcato bowing is illustrated in the following example.

Symphony No. 3 Harris

Cello 

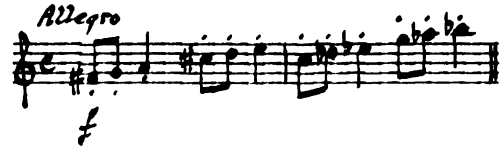
(Continued on next page.)

b.

Which passage below requires <u>marcato</u> bowing?

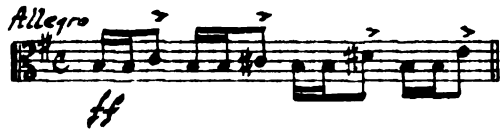
<u>Symphony No. 1</u> Piston

a.

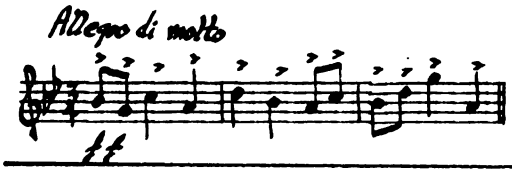


<u>New World Symphony</u> Dvořák

b.



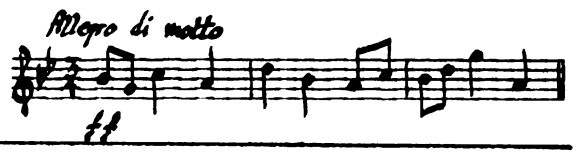
Answer: _____



62.

Mark the following passage to be played <u>marcato</u>.

<u>Enigma Variations, IV</u> Elgar



<u>Louré</u>

63.

Give the name for the style of bowing described below.

Slurred notes with a subtle push giving slight emphasis to each note.

Answer: _____

<u>Detaché</u>

64.

Proceed as in Frame 63.

Slightly more detached than <u>non-legato</u> but not accented.

Answer: _____

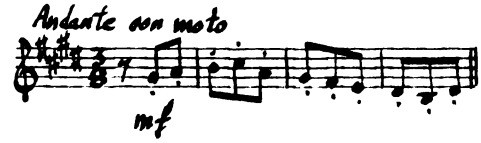
Marcato.	65. Proceed as in Frame 64. A forceful detached style appropriate for loud passages and accents. Answer: _____
(No response necessary.)	66. The staccato style of bowing produces a more sudden attack than marcato even though the dynamic level may be much lower. In other words, the staccato attack involves bow speed whereas the marcato attack involves bow pressure. In staccato bowing, as in detaché and marcato, the bow stops between notes. The staccato sound is short but unaccented and may be used at any dynamic level.
True.	67. Staccato is a more sudden attack than marcato. (True/False) _____
False.	68. Staccato bowing produces an accented sound. (True/False) _____
____c.	69. A. The staccato bow stops between notes. B. Staccato bowing may be used at any dynamic level. Check the choice below which best evaluates the above statements. ____a. A is true. ____b. B is true. ____c. Both are true. ____d. Both are false.

a.

70.
The notation of staccato bowing is the same as staccato notation for any other instrument.

Which of the following examples requires staccato bowing?

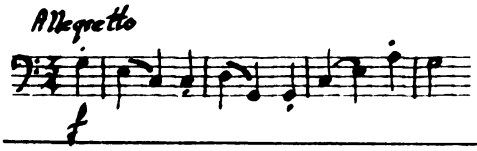
Symphony No. 8 Schubert

a. 

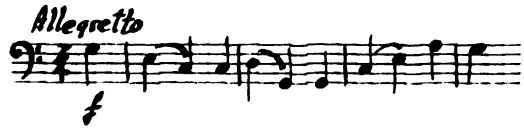
Die Meistersinger, Prelude Wagner

b. 

Answer: _____



71.
Mark the passage below so that the third beat of each measure will be played staccato.



Sudden or short but unaccented.

(Your own words.)

72.
Describe the sound produced by the staccato style of bowing.

_____

_____

_____

(Answer on next page.)

73.
A more severe type of staccato is the martelé (or hammer stroke) style of bowing. Like staccato, the martelé stroke begins on the string with a sudden attack. Notes are then

(Continued on next page.)

(No response necessary.)

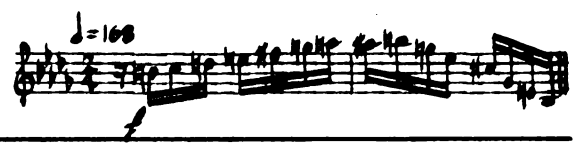
separated by stopping the bow. Martelé, however, combines the sudden attack of staccato with the forceful arm pressure of marcato. This style of bowing should be reserved for forte or fortissimo passages, however, it may be used for staccato accents in an otherwise soft passage.

74.

The indication for martelé is a small wedge (▼) placed above the notes (regardless of stem direction.)

Mark the following passage to be played martelé.

Firebird Suite Stravinsky



The sudden attack of staccato and the forceful sound of marcato.

(Your own words.)

75.

What features of staccato and marcato are combined in the martelé style of bowing?

_____

_____

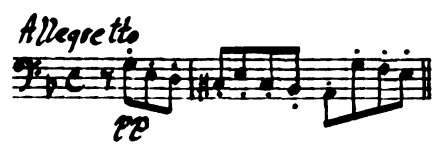
No.

76.

Would martelé be appropriate in the following passage?

Italian Symphony Mendelssohn

D. B.



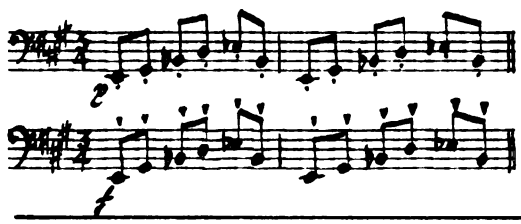
Answer: ____

For staccato accents.

(Non-staccato accents are usually played marcato.)

77. When is martelé appropriate in a passage in which the general dynamic level is soft?

_____

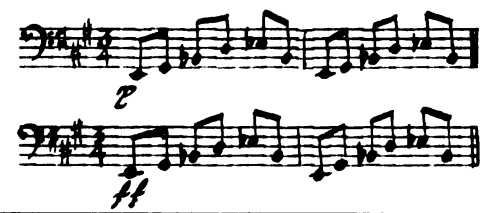


78. Each example below is to be played with a "staccato" type of bowing. Add the appropriate bowing marks to each excerpt. (Both are not the same.)

La Mer — Debussy

a.

b.



Because of the difference in dynamic levels.

(Or equivalent.)

79. Why is staccato used in excerpt (a) above, whereas martelé is used in excerpt (b)?

_____

_____

Staccato.

80. Give the name for the style of bowing described below.

A short unaccented sound possible at any dynamic level.

Answer: _____

a.
b.
c.
d.
e.
f.
g.

(Ans

(Answ

81.
Proceed as in Frame 80.

A very severe, accented staccato.

Answer: _____

Martelé.

82.
The bowing styles discussed thus far have all had one feature in common. They are all executed with the bow remaining on the string. For this reason the bowings discussed thus far are classified as on-the-string bowings.

List the on-the-string styles of bowing.

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

g. _____

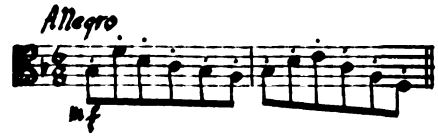
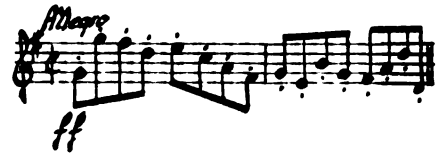
a. legato
b. non-legato (separate bows)
c. louré
d. detaché
e. staccato
f. martelé
g. marcato

(Any order.)

83.
The styles of bowing which remain to be studied, all make use of a bouncing action of the bow upon the string. Since the bow is off the string during part of the execution of these strokes, they are classified as off-the-string bowings. These off-the-string bowings are used to produce

(Continued on next page.)

(Answer on next page.)

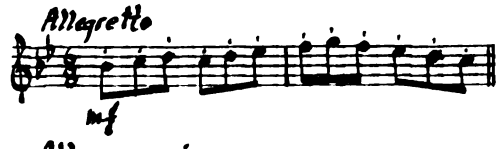
(b)ounc(ing)	several variations of the sound generally classified as "staccato". The off-the-string styles of bowing all make use of a b_ _ _ _ ing action of the bow upon the string.
staccato.	84. Off-the-string bowings are used to produce several variations of the sound generally classified as _____
spiccato	85. A very small and controlled bounce produces the spiccato style of bowing. The bow is dropped on the string and allowed to rebound. A very light and sparkling effect is produced. A small and controlled bounce produces the _____ style of bowing.
a.	86. Because the spiccato bounce is small it is usually not attempted above a forte dynamic level. In which example below is spiccato practical? a.  b.  Answer: ____

b.

87.

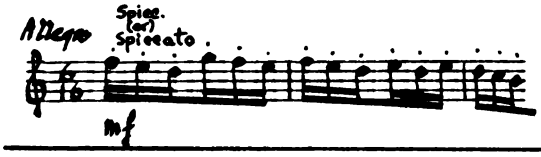
The spiccato style of bowing is often used when a staccato sound is desired at a tempo too fast for true staccato bowing. Both are indicated by the same marking (see examples below) and the player is left to decide which style he will use.

Which of the following examples would probably be played spiccato?

a. 

b. 

Answer: _____



88.

As the notation for spiccato is the same as for staccato it is best to write spiccato or spicc. above or below the notes to be played spiccato when this effect is specifically desired.

Mark the following passage to be played spiccato.

Scheherazade Rimsky-Korsakoff

(Answer on next page.)

89.

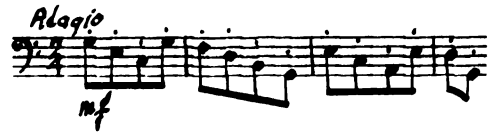
Spiccato is usually applied to rapidly moving passages and both tempo and note values are determining factors in using this style of bowing. In moderate or slow moving passages, staccato bowing is more appropriate.

(Continued on next page.)

a.

In which example below is spiccato more appropriate?

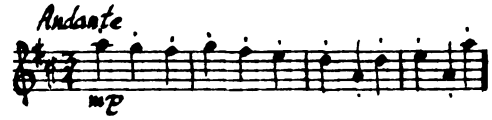
a. 

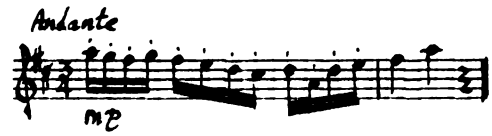
b. 

Answer: _____

b.

90. Which example below is better suited to spiccato bowing?

a. 

b. 

Answer: _____

91.

A. The spiccato style of bowing a small and controlled bounce.

B. Spiccato is practical at any speed or dynamic level.

Check the choice below which best evaluates the above statements.

_____a. A is true.

_____b. B is true.

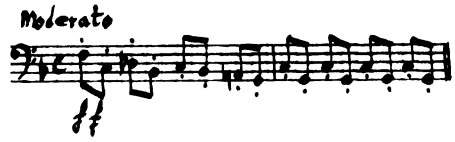
(Answer on next page.)

(Continued on next page.)

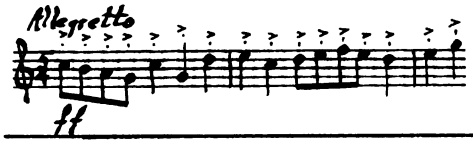
_____a.	_____c. Both are true. _____d. Both are false.
When the dynamic level is too loud for true spiccato.	92. A type of spiccato used when the spiccato effect is desired at a dynamic level that is too loud for true spiccato (fortissimo or louder) is the so-called "chopped" bow. When should "chopped" bowing be used rather than spiccato? _____
Short and heavy with little finesse. (Your own words.)	93. The term "chopped" describes this style of bowing very well. Its sound is short and heavy and has little finesse. It is done at the frog of the bow and for this reason is impractical at more than a moderate speed. Describe the sound of "chopped" bowing.
(Answer on next page.)	94. In which example below is "chopped" bowing practical? First Symphony Barber a.  (Continued on next page.)

b.

Symphony No. 5 Shostakovich

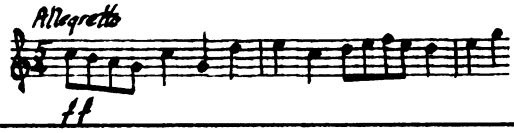
b. 

Answer: _____



95. The notation for "chopped" bowing is as follows: 

Mark the following passage to be played with "chopped" bowing.



96. Identify the off-the-string style of bowing that is called for in each of the following examples. Be sure to consider speed and dynamics.

a. spiccato.

Enigma Variations Elgar

a. 

Answer: _____

b. "chopped".

Symphony No. 5 Prokofieff

b. 

Answer: _____

(No response necessary.)

97.

One off-the-string style of bowing remains to be discussed. This is the saltando style of bowing in which a group of notes (usually 3 to 6 notes) are played all on one bouncing bow. This style of bowing is also known as jeté (French for "thrown"). The notation for saltando is shown below. A likely bowing for this example has been added.

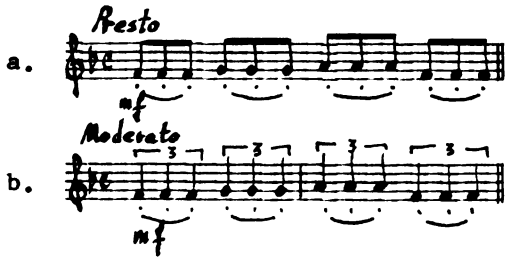
Variations for Orchestra

a.

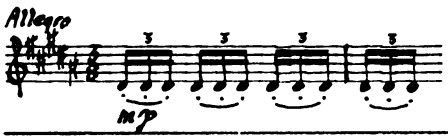
98.

Saltando bowing is usually applied to groups of rapid notes as in the example in Frame 97. When slower moving staccato notes are grouped by a bowing slur they may be played on the string without the bouncing effect of saltando. This type of bowing is referred to by some string players as group staccato.

Which example below is best suited to saltando bowing?



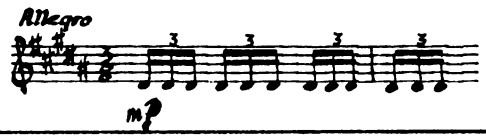
Answer: ____



99. To avoid doubt on the part of the players, it is best to write saltando above the part in addition to the slurs and dots when a true saltando effect is desired.

Mark the following excerpt to be played saltando.

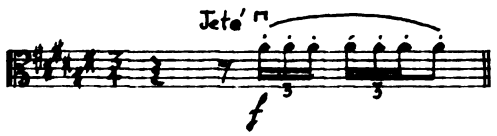
Symphony No. 2 Mahler



Piano or pianissimo.

100. Saltando is somewhat simpler to achieve at a piano or pianissimo dynamic level. When this style of bowing is requested at a forte or fortissimo level, it would be wise to indicate down-bow in the part. Consider the following example.

Firebird Suite Stravinsky

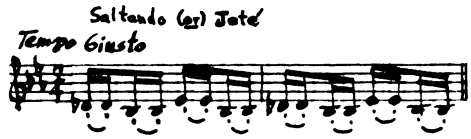


At what dynamic level is saltando best achieved? _____

Down-bow.

101. In what bow direction is a forte saltando best achieved?

_____



102.
To the excerpt below add all of the markings necessary to insure an effective saltando sound. Notice how the notes are grouped as to pitch.

Rite of Spring Stravinsky

Spiccato

103.
Identify the style of bowing described below.

A small and controlled bounce.

Answer: _____

Saltando (or jete).

104.
Proceed as in Frame 103.

A group of staccato notes played on one bouncing bow.

Answer: _____

Chopped.

105.
Proceed as above.

A short, heavy, bouncing stroke down near the frog.

Answer: _____

SUMMARY

The subject of bowing is one of much debate among string players and one of much avoidance and ignorance among non string players. Although there are few "right" and "wrong" answers, some general principles may be stated. Concerning bow direction, the downbow is usually used for strong rhythmic pulses and most accents while anacrusis, weak beats and short crescendi are more often played upbow. Bowing slurs indicate the number of notes played on one bow and care must be taken to indicate a balanced bowing so that the performer will not "run out of bow" in one direction.

In addition to bow direction, various styles of bowing must be considered. These styles of bowing are divided into two general groups, on-the-string and off-the-string bowings. In the on-the-string group, the legato style of bowing is more-or-less synonymous with the bowing slur, but notes played on separate bows can also be connected in legato style. Louré bowing is legato with a separate, subtle push on each note. Simply playing each note on a separate bow without the smoothest possible connection is the non-legato style of bowing. Various degrees of separation and accent are also possible. Detaché bowing incorporates a stop in bow motion while changing direction for each note, while a more sudden motion combined with arm pressure produces the marcato style of bowing. A more sudden attack but without arm pressure results in staccato bowing. When arm pressure as in marcato is added to a staccato attack, the martelé style of

bowing results. The off-the-string bowings all produce a staccato effect, the most used being the lightly-bouncing spiccato style. A severe spiccato played near the frog is called chopped bowing, and a group of rapid notes taken all on one bouncing bow requires the saltando or jeté style of bowing.

Performers often disagree on the finer points of these styles of bowing, sometimes apparently for the sake of argument. The most important point for the orchestrator to keep in mind, is that if his bowing indications suggest the effect that he is trying to achieve, he will usually receive an accurate performance even though the players do not follow his bowing literally.

1.
Previous chapters were devoted to the conventional manner of playing stringed instruments, that is producing one sound at a time by drawing the bow hair across the strings at a point between the bridge and the fingerboard, while the strings are stopped against the fingerboard by the fingers of the left hand. In this chapter we will discuss the so-called "special effects" which the orchestrator may use, either to achieve a varied tone quality, or when he wishes two or more pitches to be sounded simultaneously on the same instrument.

What two phenomena can be achieved through the use of special effects?

a. _____

b. _____

_____

a. Varied tone quality.

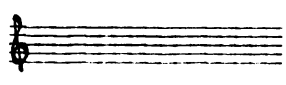
b. Two or more pitches sounded simultaneously on the same instrument.

(Any order.)

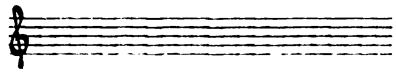
2.
One method of altering the normal tone quality of any of the stringed instruments is through the use of harmonics. These harmonics are simply the overtones which are present to varying degrees in the composite tone of the instrument. By employing a special left-hand technique, a string player can cause certain of these overtones or harmonics to sound without the presence of their fundamental (the tone by which the harmonic series is generated).

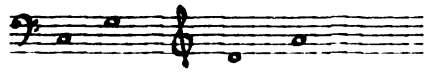
A harmonic is one of the _____ present in the composite tone of the instrument.

overtones

No.	3. Harmonics have soft, airy, flute-like sounds. Do you think that harmonics would be effective in a <u>forte</u> passage? _____
Soft, airy, flute-like	4. Describe the sound of harmonics. _____
natural (<u>and</u>) artificial	5. Two types of harmonics are possible on stringed instruments, natural and artificial. <u>Natural harmonics</u> are the overtones of open strings. The two types of harmonics possible on stringed instruments are _____ and _____.
open	6. Natural harmonics are the overtones of _____strings.
	7. Natural harmonics are produced by touching one of the open strings lightly, (not hard enough to stop it against the fingerboard) with one of the fingers of the left hand while the string is vibrating. If a string is touched lightly at a point one octave above its open pitch, the harmonic one octave above the open pitch will sound. This is called the first natural harmonic. Notate the sounding pitch of the first natural harmonic of the violin's A string on the staff below. 

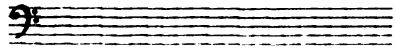
8. Notate the sounding pitch of the first natural harmonic of each of the strings of the viola on the staff below.

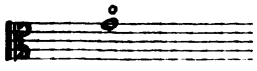




9. Notate the sounding pitch of the first natural harmonic of each of the strings of the cello on the staff below.

10. Notate the sounding pitch of the first natural harmonic of each of the strings of the double bass on the staff below. Remember that the double bass sounds an octave lower than written.

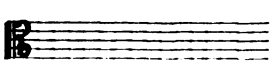




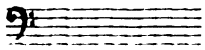
11. The first natural harmonic is notated by writing the <u>written</u> pitch of the harmonic with a small circle above it as follows:

This circle is not to be confused with the zero used to show that a note is to be played on an open string.

Show the proper notation of the first natural harmonic of the G string of the viola on the staff below.

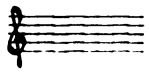


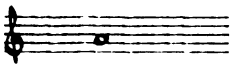
12.
Notate the first natural harmonic of the cello's A string.



13.
Notate the sounding pitch of the natural harmonic illustrated below on the treble staff provided.

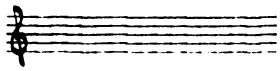
Viola 

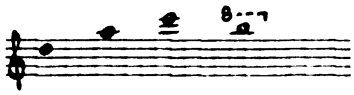
Answer: 



14.
The second natural harmonic has a pitch one octave and a perfect fifth above the pitch of the open string on which it is played.

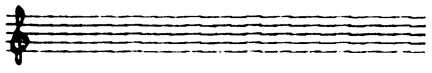
Notate the sounding pitch of the second natural harmonic of the D string of the cello on the staff below.





15.
Notate the sounding pitch of the second natural harmonic of each of the violin's strings on the staff below. Use the ottava sign where appropriate.

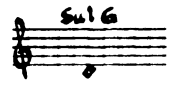
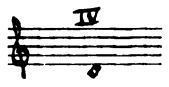
16.
Notate the sounding pitch of the second natural harmonic of each of the strings of the viola on the staff below.



18.

The second natural harmonic can be produced in two ways: (a) by touching the string lightly at a point a perfect fifth above the pitch of the open string or (b) by touching the string lightly at the point where the same pitch as the harmonic would ordinarily be played.

Method (a) is notated by a diamond-shaped notehead representing the pitch a perfect fifth above that of the open string and by identifying the open string as follows:

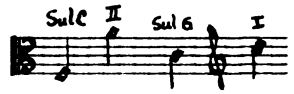
Violin  or 

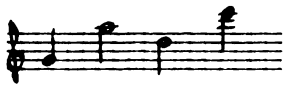
Notate the pitch which would result if either of the above examples was played.

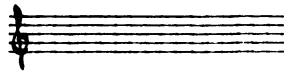
Answer: 

19.

Notate the sounding pitches of the following harmonics on the staff provided.

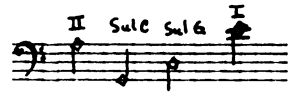
Viola 

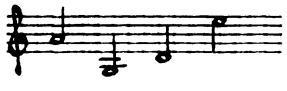


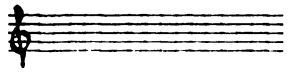
Answer: 

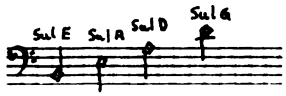
20.

Proceed as above.

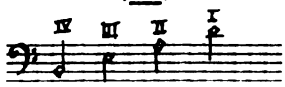
Cello 



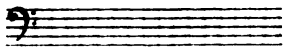
Answer: 

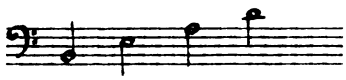


(or)

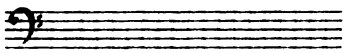


21. On the staff below, notate the second natural harmonic of each of the strings of the double bass. Be sure to identify the open string for each harmonic.

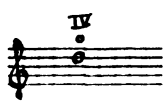
D. B. 



22. Write the sounding pitch of each of the harmonics in Frame 21 on the staff below, (remember that the double bass is a transposing instrument.)

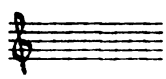


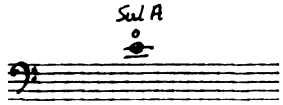
23. Method (b) in Frame 18 is notated by indicating the written pitch of the harmonic as a conventional notehead with a small circle above it and by identifying the open string as follows:

Violin 

or 

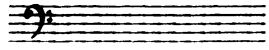
On the staff below notate the pitch which would result if the above examples were played.

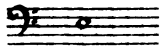
Answer: 



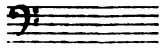
(or)

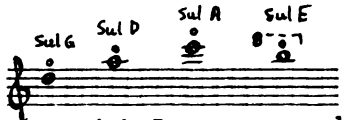
24. Using the above method, notate the second natural harmonic of the A string of the double bass on the staff below. Remember to use the written pitch of the harmonic, not its actual sounding pitch.

D. B. 



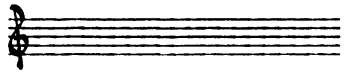
25. On the staff below, notate the sounding pitch of the harmonic in Frame 24.

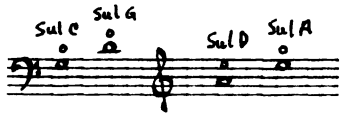
Answer: 



(Or with Roman numerals.)

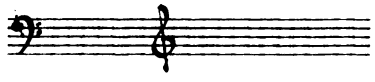
26. Using method (b) as in Frame 24, notate the second natural harmonic of each of the strings of the violin on the staff below. Use the ottava sign where appropriate.

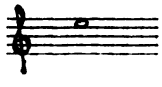
Violin 



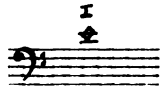
(Or with Roman numerals.)

27. Proceed as above.

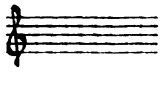
Cello 

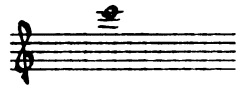


28. What is the sounding pitch of the harmonic notated below?



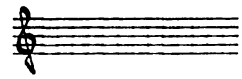
Cello

Answer: 

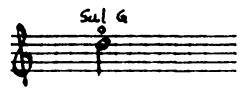


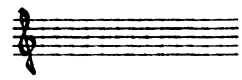
29.
What is the sounding pitch of the following harmonic?

Violin 

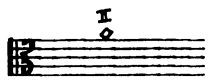
Answer: 

30.
What is the sounding pitch of the harmonic notated below?

D. B. 

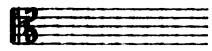
Answer: 

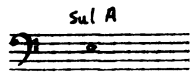
(or)



31.
Using a diamond shaped notehead, notate the pitch given below as the second natural harmonic of one of the strings of the viola.

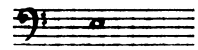
Sounding pitch: 

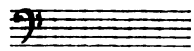
Viola 

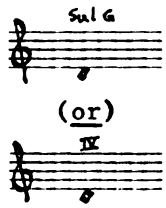


(or)

32.
Using the above method, notate the following pitch as the second natural harmonic of one of the strings of the double bass.

Sounding pitch: 

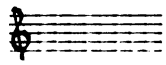
D. B. 



(or)

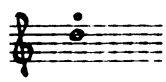
33.
Proceed as in Frame 32.

Sounding pitch: 

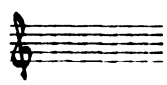
Violin 

D

34.
The same pitch as the second natural harmonic of the violin's G string (Frame 33) can be produced as the first natural harmonic of violin's _____ string.
(letter)



35.
Show how the sounding pitch given in Frame 33 would be notated as the first natural harmonic of the violin's D string.

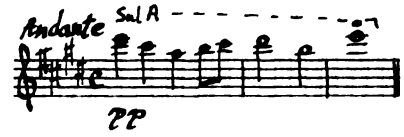
Violin 

(No response necessary.)

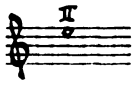
36.
The fact that some natural harmonics can be played on two different strings, prompted earlier composers and writers on orchestration to notate all natural harmonics simply with the small circle above them, and let the performer decide which string to use. This "guessing-game" method places an unnecessary burden on the performer, and may lead to disasterous hesitations or wrong notes in performance. It should not be used!

37.

In most cases either method of notating or playing the second (and higher) natural harmonic is equally satisfactory. In some cases, however, this is not true. Consider the following example.

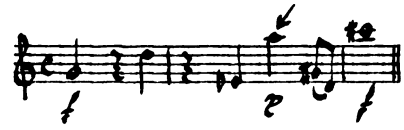


When reading the notation above, the player will produce the harmonic in the same left-hand position as the notes proceeding it. If the harmonic had been notated as follows,

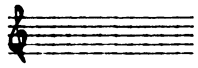


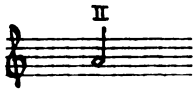
an unnecessary shift would result.

In the following example, the composer wishes the note indicated by an arrow to be played as the second natural harmonic of one of the strings of the violin. On the staff provided show the <u>best</u> way of notating this harmonic.

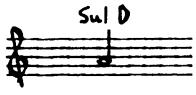


Answer:





(or)



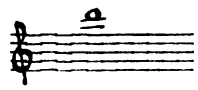
38.

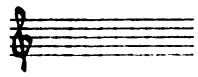
The third natural harmonic sounds two octaves higher than the open pitch of the string on which it is played.

(Answer on next page.)

(Continued on next page.)

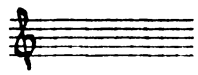
Notate the sounding pitch of the third natural harmonic of the D string of the viola on the staff below.





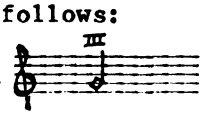
39.

Notate the sounding pitch of the third natural harmonic of the cello's A string.

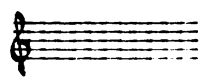


40.

Like the second natural harmonic, the third can be played in two ways: (a) by lightly touching the string at a point a perfect fourth above the pitch of the open string, or, (b) by lightly touching the string at the point where the written pitch of the harmonic would ordinarily be played. If method (a) is desired, the notation is as follows:

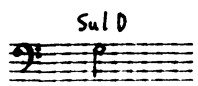
Violin 

What pitch would result if the above example was played?

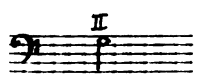
Answer: 

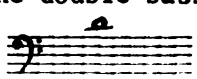
41.

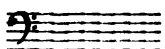
Using the above method, notate the sounding pitch given below as the third natural harmonic of one of the strings of the double bass.

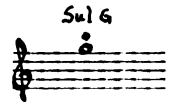


(or)



Sounding pitch: 

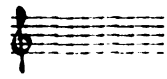
Notation: 

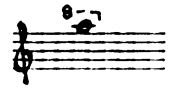


(or)

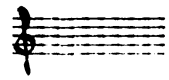
42. If the string is to be touched lightly at the point where the pitch of the third natural harmonic would ordinarily be played, (method b in Frame 28) the written pitch of the harmonic is notated with a circle above it and the string is identified (as in notating the second natural harmonic).

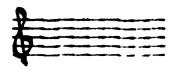
Using this method, notate the third natural harmonic of the G string of the viola on the staff provided.

Viola 

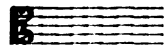


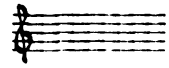
43. On the staff provided, notate the actual pitch of the harmonic illustrated below. (Use the ottava sign).

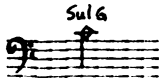
Violin 

Answer: 

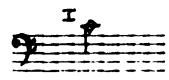
44. On the staff provided, notate the sounding pitch of this harmonic:

Viola 

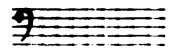
Answer: 



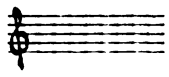
(or)



45. On the staff provided, use a diamond-shaped note to indicate the third natural harmonic of the G string of the double bass.

Double bass 

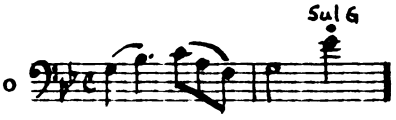
46.
Notate the actual sounding pitch of the harmonic in Frame 45 on the staff below.



b.

47.
As in the case of the second natural harmonic, the choice of notation (and playing position) of the third natural harmonic may depend on the notes surrounding the harmonic.

Which of the examples below illustrates the easier way of playing the harmonic?

a. Cello 

b. Cello 

Answer: ____

Because the left hand would be much closer to where c would be played on the G string than to where g would be played on the G string.

(Or equivalent.)

48.
Why is answer (b) the better choice in the preceding Frame?

_____

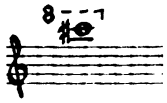
_____

_____

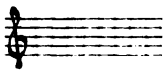
49.
A fourth natural harmonic is also possible but is seldom used because the same pitch can usually be obtained as a harmonic in a simpler way. The fourth natural harmonic is located two octaves and a major third above the pitch of the open string on which it is played.

(Answer on next page.)

(Continued on next page.)



Notate the sounding pitch of the fourth natural harmonic of the violin's A string on the staff below. (Use the ottava sign).



50.

The fourth natural harmonic can be played in four different ways. The following example shows four ways of notating the same harmonic. (The diamond-shaped note heads mark three different places, in addition to the point where the note is ordinarily played, at which the string may be touched.)

Violin 

Identify the four points at which the string may be touched to produce the fourth natural harmonic.

1. A major third above the open pitch.
2. A major sixth above the open pitch.
3. A major tenth above the open pitch.
4. At a point where the same pitch as the harmonic would ordinarily be played.

(Or equivalent.)

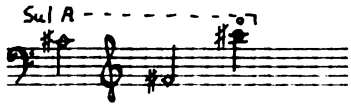
1. _____
2. _____
3. _____
4. _____

_____

(No response necessary.)

51.

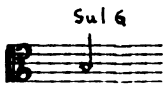
It should be noted here that playing the fourth natural harmonic by touching the string a major tenth above its open pitch is rarely done. Any of the other three positions are easier to find and produce a more solid tone.

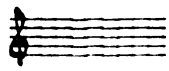


52.
Show the three commonly-used methods notating  as the fourth natural harmonic of one of the strings

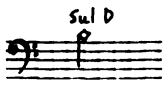
Answer: 

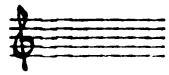
53.
What pitch would sound if the following example was played.



Answer: 

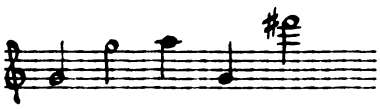
54.
Proceed as above.



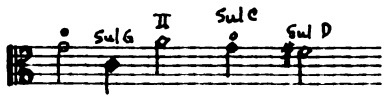
Answer: 

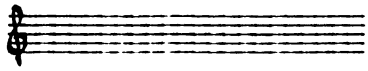
(No response necessary.)

55.
Higher natural harmonics than the four discussed there are possible, but are rarely used except in virtuoso solo writing because the same pitches can be obtained as harmonics more easily in another way.



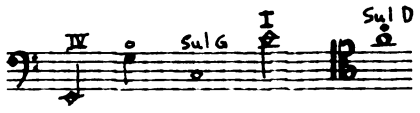
56.
Notate the sounding pitches of the following harmonics on the staff provided.



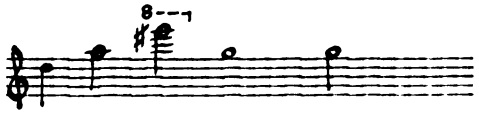
Answer: 

57.

Proceed as in the previous frame.

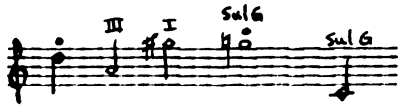
Cello 

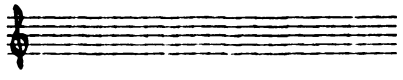
Answer: 



58.

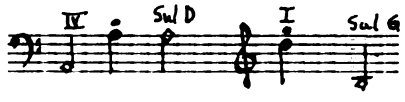
Proceed as above. Use the ottava sign where appropriate.

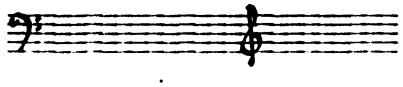
Violin 

Answer: 

59.

Proceed as above.

D. B. 

Answer: 

60.

Thus far we have discussed only those harmonics which are found in the overtone series of the open strings. Obviously these <u>natural harmonics</u> do not include all twelve tones of the chromatic scale.

The missing notes (as well as the pitches available as natural harmonics) are present in the overtones generated by the various stopped pitches. These are called <u>artificial harmonics</u>.

<u>Artificial harmonics</u> are necessary because all twelve pitches of the chromatic scale are not available as _____ harmonics.

natural

artificial

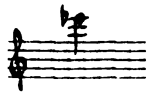
61. Harmonics found in the overtone series of a stopped pitch are called _____ harmonics.

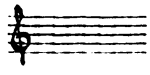
62. The left-hand technique for producing artificial harmonics will obviously be different than for natural harmonics as one must first have a stopped pitch to generate the artificial harmonic. Only one type of artificial harmonic is commonly used in orchestral music. It is produced as follows: the first finger stops a given pitch; the fourth finger touches a point a perfect fourth above the stopped pitch; a harmonic two octaves above the stopped pitch is produced. The notation of an artificial harmonic is shown below.

Violin 

The conventional notehead indicates the stopped pitch and the diamond notehead indicates the point where the string is touched.

Notate the sounding pitch of the artificial harmonic illustrated above, on the staff below.



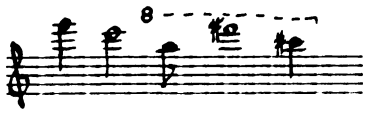


63. Notate the sounding pitches of the following harmonics on the staff provided. Use the ottava sign where practical.

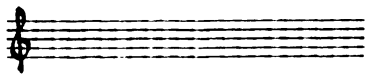
Violin 

(Answer on next page.)

(Continued on next page.)



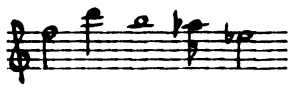
Notice that the diamond notehead is always "open" while the conventional notehead indicates the rhythm.

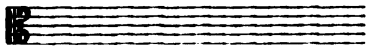
Answer: 

64.

There is usually no need to identify the string on which the artificial harmonic is to be played, as it will usually be played in the lowest possible position. (An exception to this principle is discussed later.)

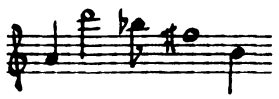
Notate the following <u>sounding pitches</u> as artificial harmonics for the viola on the staff provided. Use the given rhythmic values.

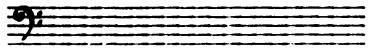
Sounding pitches: 

Viola 

65.

Notate these sounding pitches as artificial harmonics for the cello on the staff provided.

Sounding pitches: 

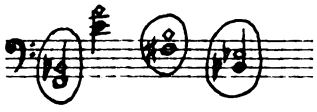
Cello 

66.

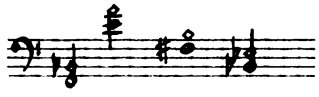
Because the notes lie farther apart on the fingerboard, artificial harmonics are impractical below fifth or sixth position on the double bass and cello except for advanced players who are adept in using the thumb positions.

(<u>Answer on next page.</u>)

(<u>Continued on next page.</u>)

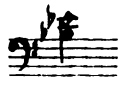


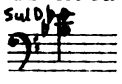
Circle those harmonics in the group below, which are practical only for advanced players if played in the lowest possible position.

Bass 

67.

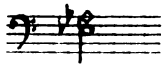
Sometimes an "impractical" artificial harmonic can be made practical by playing it in a higher position on a lower string.

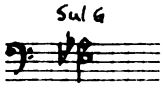
For example:  is rather impractical on the G string but if notated in this manner:



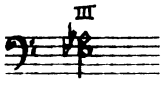
it is quite playable.

Add the proper direction to the harmonic below to make it more playable.

Cello 

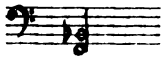
Cello 

(or)

Cello 

68.

Can the following harmonic be given a more playable notation?

Bass 

Answer: _____ Why? _____

_____

No. Because there is no lower string.

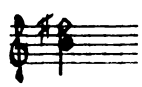
(Or equivalent.)

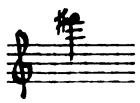
69.

The preceding practice is not used extensively in orchestral music and should be used only when absolutely necessary. Use natural harmonics whenever possible on the double bass.

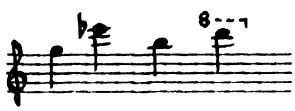
70.

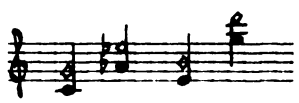
A second type of artificial harmonic is also possible but is seldom used in orchestral music, because of the greater stretch of the left hand which it requires. If the string is touched lightly a perfect fifth above the stopped pitch, a harmonic one octave and a perfect fifth above the stopped pitch results.

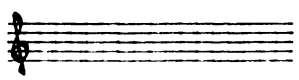
Harmonic: 

Sounding pitch: 

Notate the sounding pitches of the following artificial harmonics on the staff provided. Use the ottava sign where appropriate.



Violin 

Answer: 

71.

Is the type of artificial harmonic illustrated in the previous Frame widely used in orchestral music?

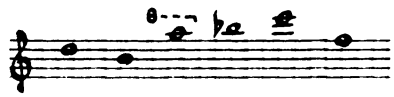
No.

Answer: ____

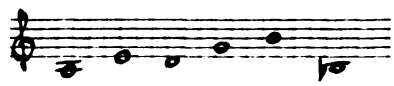
72.
The following general procedure is recommended for writing any pitch as a harmonic.

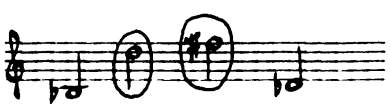
First see if the desired pitch is available as a natural harmonic. If so, notate it as such.

Circle those pitches in the following group which are available as natural harmonics on the violin.



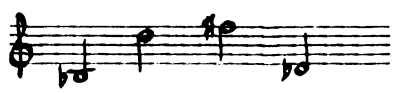
73.
Circle those pitches in the following group which are available as natural harmonics on the double bass.





74.
If the desired pitch is not available as a natural harmonic then notate it as a practical artificial harmonic.

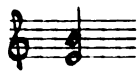
Circle those pitches in the following group which are <u>practical</u> as artificial harmonics on the double bass.



75.
Avoid the use of any artificial harmonic for the double bass and avoid artificial harmonics touched a perfect fifth above the stopped pitch on the other stringed instruments unless you are writing for advanced players.

(<u>Answer on next page</u>.)

(<u>Continued on next page</u>.)

Artificial.	What type of harmonics should be avoided for the double bass? _____
False.	76. The following type of harmonic,  is practical for string players of any ability. (True/False) _____
Advanced.	77. For what ability group is the harmonic illustrated in Frame 76 practical? _____
(No response necessary.)	78. The three commonly used natural harmonics and most artificial harmonics, are not actually too difficult for high school string players, in spite of the fact that harmonics are not taught in many high schools. The rule to follow here is know the players for whom you are scoring, before writing harmonics for them.
False.	79. All harmonics should be avoided in high school string parts. (True/False) _____

If you know that the group for which you are scoring can play them.

(Or equivalent,)

80. Under what circumstances are harmonics appropriate for high school string players?

_____

_____

_____

Sur la touche.

81. The timbre of the stringed instruments can also be altered by the way in which the bow is used. One such effect is identified by the Italian term sul tasto. (Ger. am Griffbrett, Fr. sur la touche). To achieve this effect the strings are bowed over the fingerboard rather than between the fingerboard and the bridge.

What is the French term for bowing over the fingerboard?

_____

The strings are bowed over the fingerboard.

82. Describe the bowing called for in the following example.

Symphonic Elegy Krenek

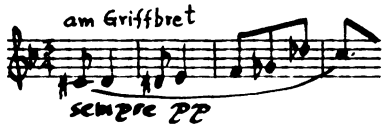
Answer: _____

(Answer on next page.)

83. This effect is notated by writing the appropriate term above the passage to be bowed over the fingerboard.

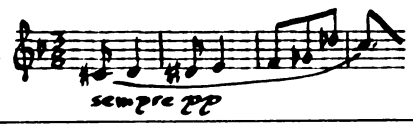
(Continued on next page.)

(No response necessary.)	A rare example of double sul tasto harmonics is shown here. Sheherazade Ravel Cello  This effect must be heard to be appreciated.
✓ c.	87. Another bowing effect which produces a unique timbre is identified by the Italian term sul ponticello (Ger. am Steg, Fr. au chevalet). This effect is achieved by bowing over, or very close to, the bridge. Place a check (✓) before the term below which means "at the bridge". ____a. sur la touche ____b. martelé ____c. am Steg
✓ b.	88. Proceed as above. ____a. sul tasto ____b. sul ponticello ____c. am Griffbrett
Au chevalet.	89. What is the French equivalent of sul ponticello? _____

Violin 

Using the German terminology, mark the following passage to be bowed over the fingerboard.

Symphony No. 4 Mahler

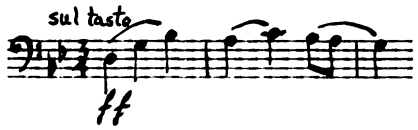
Violin 

Sul tasto is used in soft passages but not for loud playing.

(Or equivalent.)

84. The timbre of sul tasto bowing lacks the "edge" and carrying power of the normal string tone. This effect is synonymous with a soft dynamic level.

Describe what is wrong in the following example.

Cello 

Answer: _____

_____

Sul tasto lacks the edge and carrying power of the normal string tone.

(Or equivalent.)

85. Describe the timbre of sul tasto bowing.

_____

_____

_____

(Answer on next page.)

86. Sul tasto is sometimes combined with other effects such as the glissando and tremolo (discussed later).

(Continued on next page.)

90.

The sound of sul ponticello is thin and "glassy". This characteristic timbre will be lost if the effect is attempted above a piano dynamic level. (In traditional orchestral music, it is usually accompanied by the bowed tremolo which will be explained later.)

Sul ponticello is practical at any dynamic level.

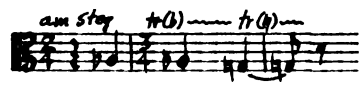
(True/False) _____

False.

91.

As are other bowing indications, this effect is indicated above the staff as in the following example.

Five Pieces for Orchestra Webern

Solo Br. 

Describe the sound called for in the excerpt above.

_____

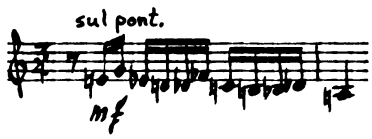
Thin and "glassy".

92.

When the Italian terminology is used it is usually abbreviated sul pont. Using this terminology, mark the following passage to be played at the bridge.

Five Pieces for Orchestra

Schoenberg

Violin 

Violin 

93. Place a check (✓) before the term below which means "at the bridge".

_____a. sur la touche

✓ b. _____b. au chevalet

_____c. sul tasto

---

94. Place a check before the term below which means "over the fingerboard".

_____a. am Steg

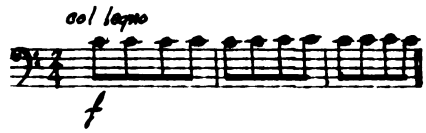
_____b. sul pont

✓ c. _____c. sul tasto

---

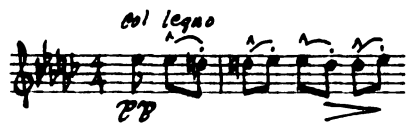
95. Col legno (It. and Ger.) directs the player to use the bow stick against the strings. (The French term, avec le bois, is seldom used.) This may be done in two different ways. The bow stick may be bounced against the string as in the following example:

(a) Rite of Spring Stravinsky



or the stick may be drawn across the string as in this example:

(b) Symphony No. 1 Mahler



(Answer on next page.)

(Continued on next page.)

The bow stick may be drawn across the strings or bounced against the strings.

(Or equivalent.)

Describe two ways in which col legno may be performed.

_____

_____

_____

96.

Example (a) above will produce a clicking sound of semi-definite pitch and is best suited to rhythmic figures. This is the usual interpretation of the direction col legno. To avoid doubt on the part of the player, the complete direction, col legno battuto (strike with the wood) may be written above the staff.

Mark the following example to be played in the above manner. (Notice the saltando-like grouping of the notes.)

Firebird Suite Stravinsky

Cello 

Cello 

A clicking sound of semi-definite pitch.

97.

Describe the sound called for in the answer to the question in Frame 96.

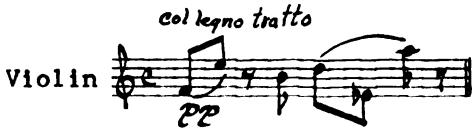
_____

_____

98.

The second type of col legno, in which the bow stick is drawn across the string, is less frequently used and for this reason should always bear the complete direction col legno tratto (draw with the wood). Only a "dry whisper" of sound can be produced in this manner due to the small amount of friction between the stick and the string.

Mark the following passage to be played in the above manner.



99.

Describe the sound called for in the answer to Frame 98.

A dry whisper.

100.

Describe the manner in which the type of col legno indicated in the following example, is played.

Piano Concerto Schoenberg

The bow stick is struck or bounced against the string.

(Or equivalent.)

Answer: _____

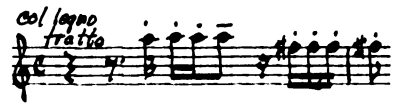
The bow stick is drawn across the string.

(Or equivalent.)

101.

Proceed as in Frame 100.

Piano Concerto Schoenberg

Violin 

Answer: _____

_____

Col legno.

102.

As stated in Frame 79, the usual interpretation of the simple direction col legno is col legno batutto. When this style is obviously correct, as in rhythmic figures, the simple direction, col legno, is sufficient.

What direction is necessary to indicate that the following excerpt is to be played with the wood.

Rite of Spring Stravinsky

Violin 

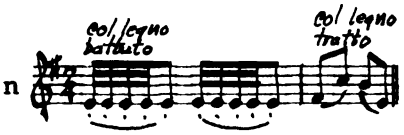
Answer: _____

(Answer on next page.)

103.

In cases where there could be any doubt as to the orchestrator's intentions and especially in scores where both types of col legno are used, complete directions should be given.

(Continued on next page.)

Violin 

Mark the following exercise so that the first measure will be struck with the wood and the second measure will be drawn with the wood.

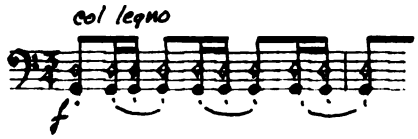
Violin 

(No response necessary.)

104.

The col legno effect can also be used in conjunction with other special effects such as the glissando and tremolo (discussed later) and even with harmonics as in the following excerpt.

Firebird Suite Stravinsky

D. B. 

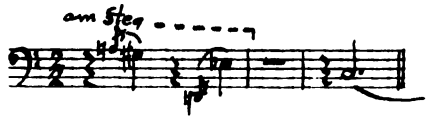
(The above notation of natural harmonics is incorrect by current standards.)

(Answer on next page.)

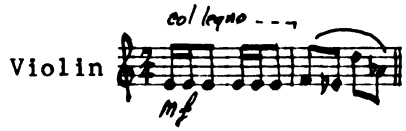
105.

The duration of any of these three effects: sul tasto, sul ponticello, and col legno, may be indicated in two ways. The first method is the broken-line bracket over those notes to be played with the special effect. Study the following example.

Symphony, Op. 21 Webern

Cello 

(Continued on next page.)

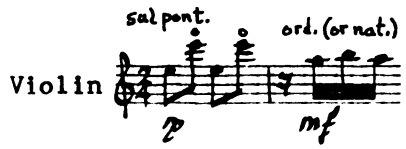


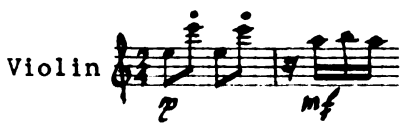
Using this method, mark the example below in Italian so that the first measure will be played with the wood.

106.

An alternate method of indicating the cessation of a special effect is by the indication modo ordinario or naturale (in the ordinary manner). The complete indication or the abbreviations ord. or nat. may be written above the staff at the point of cessation.

Using the above method, mark the following passage so that the sul ponticello will cease at the beginning of the second measure.





107.

Give the Italian, French and German terms for bowing over the fingerboard.

Sul tasto. It. _____

Sur la touche. Fr. _____

Am Griffbrett. Gr. _____

108.

Give the Italian, French, and German terms for "at the bridge".

Sul ponticello. It. _____

Au chevalet. Fr. _____

Am Steg. Gr. _____

The bow stick is bounced against or drawn across the strings.

(Your own words.)

109.

Explain col legno in your own words.

_____

_____

_____

A smooth sliding or "swooping" sound which passes through every fractional pitch gradation between the initial and final pitch of the glissando.

(Or equivalent.)

110.

Another special effect available to the orchestrator is the glissando. On stringed instruments a glissando is achieved by sliding a finger of the left hand along the string (keeping the string pressed against the fingerboard throughout the slide) while the bow is being drawn. This produces a smooth sliding, "swooping" sound which passes through every fractional pitch gradation between the initial and final pitches of the glissando.

Describe the sound of a glissando.

_____

_____

_____

(Answer on next page.)

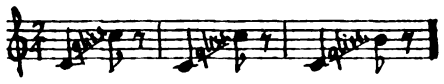
111.

The glissando may be notated in two slightly different ways. Notice that the important abbreviation gliss. is included in both notations.

Notation (a): 

Notation (b): 

(Continued on next page.)



(or)

Notice that the straight or wavy line goes from one notehead to the next.

Indicate a glissando between each pair of notes in the following example.

Concerto for Orchestra Bartok

Vln. II 

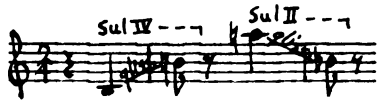
112.

Although in some scores the string on which the glissando is to be played is indicated, this would seem unnecessary as the glissando must always be played on that string whose open pitch is immediately below the lowest pitch of the glissando.

Place a check (✓) before the example below which contains unnecessary markings.

Dance Suite Bartok

✓ (a)

___(a) 

Symphony No. 4 Mahler

___(b) 

113.

The most important fact about the true glissando is that it must be played on only one string. Some composers have been known to write "impossible" glissandi as in the following excerpt:

(Answer on next page.)

(Continued on next page.)

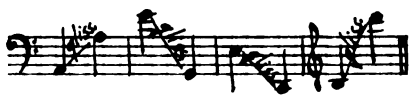
La Valse Ravel

Vln. I 

The beginning note, g^3, is not possible on the G string of the violin so the players will have to begin on the D or A string and cross over to the G string coming as close to a true glissando as possible. (Probably Ravel realized this and preferred a "faked" glissando to starting on a lower pitch.)

Generally speaking, any glissando beyond the interval of an octave is difficult to play with a good solid tone and an octave plus a perfect fifth should be considered the maximum practical limit for a true glissando.

Circle those glissandi in the following group which are practical as a true glissando.

Cello 

True.

114. Generally speaking, any glissando beyond the interval of an octave is difficult to play with a good solid tone.

(True/False) _____

An octave plus a perfect fifth.

115. What interval should be considered the maximum practical limit for a true glissando?

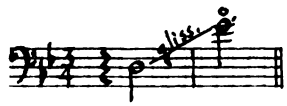
Answer: _____

(No response necessary.)

116.

The glissando may incorporate harmonics in one of two ways. The first is the glissando to a natural harmonic as in the following example:

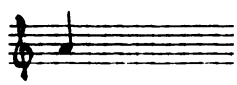
La Valse Ravel

Cello 

117.

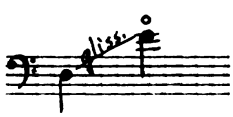
Notice that the harmonic is notated at its written pitch with the small circle above it and that the string is not identified as it is part of a glissando.

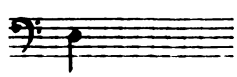
On the staff below notate a glissando from the starting pitch given to the second natural harmonic of the violin's D string.



118.

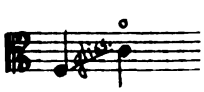
On the staff below, notate a glissando from the starting pitch given to the third natural harmonic of the cello's G string.

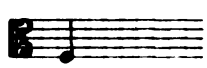




119.

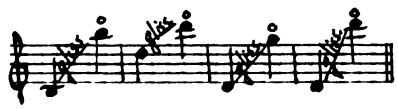
Proceeding as above, notate a glissando from the given pitch to the first natural harmonic of the viola's C string.





120. The practical interval for a glissando to cover (Frame 113) also applies to the glissando to a harmonic.

Circle those glissandi in the group below which are practical.

Violin 

121. The second way in which the glissando may be combined with harmonics, is the glissando entirely in natural harmonics as illustrated in the following example:

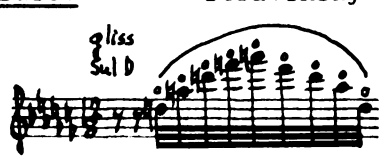
Rite of Spring Stravinsky

Viola 

The pitches notated in this case are the second through the eighth natural harmonics of the open string. The sound produced is more an "errie slide" than any definite pitches.

Another example using the first through the fifth natural harmonics of the violin's D string, is shown below. Study the notation of the example.

Firebird Suite Stravinsky

Violin II 

(Answer on next page.)

(Continued on next page.)

Describe the sound produced by a glissando in harmonics.

_____

_____

_____

More an errie slide than any definite pitch.

(Or equivalent.)

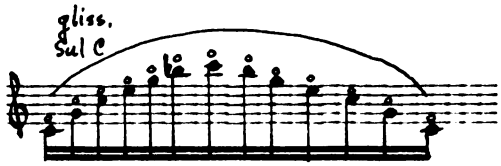
122. The glissando in harmonics usually encompasses at least six pitches of the overtone series and should be written only for advanced players.

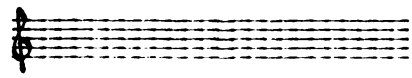
On the staff below, notate a glissando in harmonics ranging from the first through the sixth natural harmonic of the violin's G string and back down. Use sixteenth notes.

123. The glissando in harmonics is appropriate only for _____ players. (ability group)

advanced

124. On the staff below, notate a glissando in harmonics from the first through the seventh natural harmonic of the viola's C string and back down. Use sixteenth notes.



Viola 

125.

The glissando may also be combined with other special effects as in the following examples:

Daphnis and Chloe — Ravel

a. Cello 

(No response necessary.)

Symphony No. 1 — Milhaud

b. Cello 

126.

The portamento is a rapid and barely perceptible glissando. It is done more suddenly than a true glissando, and is usually inserted by players without direction to give an extremely legato effect.

Define portamento. _____

_____

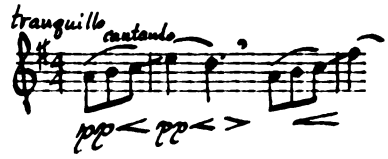
A short and barely perceptible glissando.

(Or equivalent.)

127.

The portamento has often been notated simply with a line between the notes to be joined, as in the following example:

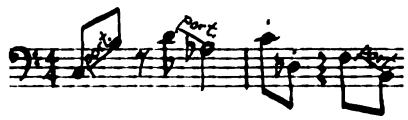
Symphony No. 4 — Mahler

Violin I 

(Answer on next page.)

(Continued on next page.)

However, it is best to write the abbreviation port. along the line joining the two notes to avoid doubt as in this example:

Cello 

Mark the following passage so that each pair of eighth notes will be joined in portamento style.

Music for String Instruments Percussion and Celesta Bartok

Viola 

128. In your own words, explain the difference between glissando and portamento.

The glissando is a definite "sliding" effect while the portamento is a barely perceptible slide.

(Your own words.)

129. Probably the most used special effect is the tremolo. There are two types of tremolo: (a) bowed tremolo is the rapid reiteration of one pitch; (b) fingered tremolo is the rapid alternation between two different pitches.

The rapid reiteration of one pitch is called _____ tremolo.

bowed

fingered	130. The rapid alternation between two different pitches is called _____ tremolo.
bowed (and) fingered (Any order.)	131. The two types of tremolo, _____ and _____, can each be broken down into two subdivisions: measured and unmeasured. We will first discuss the unmeasured, bowed tremolo.
a. Tension. b. Peaceful, shimmering effect. (Any order.)	132. In the unmeasured, bowed tremolo, up and downbows are alternated as rapidly as possible in a detaché manner. Two general aesthetic effects can be achieved with this tremolo. If played loudly and forcefully, a high degree of tension can be created; while at a high pitch and soft dynamic level a peaceful, shimmering effect can be produced. Perhaps a word of caution at the outset is in order. The two tremolo effects described above have been so widely used, especially in the nineteenth century, that they may sound trite if overused. Name two aesthetic effects that can be achieved by a tremolo. a. _____ b. _____

peaceful, shimmering

(Or equivalent.)

133. A tremolo at a high pitch and soft dynamic level produces a _____ effect.

A loud and forceful tremolo.

134. What type of tremolo is used to create tension? _____

_____

False.

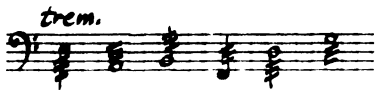
135. The tremolo is a fresh effect that can be used extensively without becoming trite or boring. (True/False) _____

136. The unmeasured, bowed tremolo is notated by drawing three slashes above or below a whole note, or through the stem of a half or quarter note. The abbreviation trem. is written above the note. (For several tremolo notes in succession, the abbreviation trem. need only be written above the first tremolo note.)

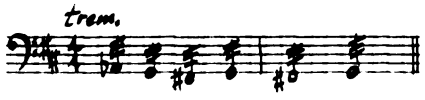
The following example illustrates the notation of unmeasured, bowed tremolo in whole, half and quarter notes.

(Answer on next page.)

(Continued on next page.)



Supply only the necessary slashes to each note in the following group to indicate an unmeasured, bowed tremolo.

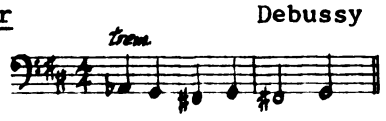


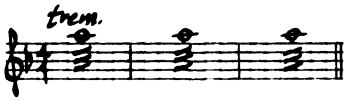
137.

Mark the following passage to be played entirely in unmeasured, bowed tremolo.

La Mer — Debussy

D. B.





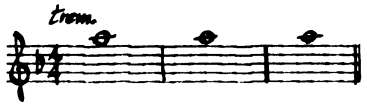
138.

Proceed as above.

Russian Easter Overture

Rimsky-Korsakow

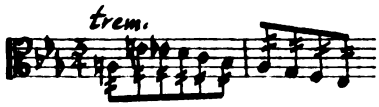
Violin



139.

To notate the unmeasured, bowed tremolo with notes having flags or beams, one less slash per flag or beam is used. In other words, each flag or beam takes the place of one slash. Study the following example:

Supply only the necessary slashes to each note in the following group to indicate an unmeasured, bowed tremolo.



140.

Proceed as in Frame 139.

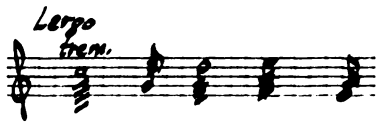
Symphony No. 3 Beethoven

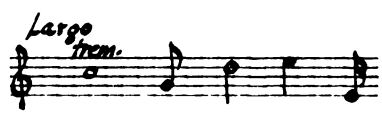
Vla. 

141.

At a very slow tempo it is advisable to use one extra slash for each note value so that the players will definitely play an unmeasured tremolo rather than thirty-second notes. In other words, four slashes for whole, half and quarter notes, three for eighth notes, and so forth.

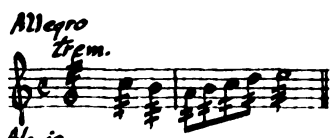
Mark each note below to assure an unmeasured, bowed tremolo at the tempo indicated.

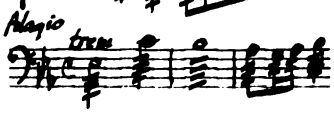


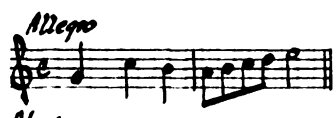


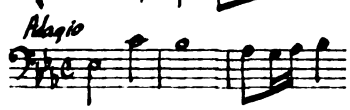
142.

Add all markings necessary to each passage below to indicate an unmeasured, bowed tremolo on every note.

a. 

b. 

a. Vln. 

b. Vc. 

143. What principle is followed in notating an unmeasured, bowed tremolo at a very slow tempo?

_____

_____

_____

Use one slash more than the usual number for each note value.

(Or equivalent.)

144. As the name measured, bowed tremolo implies, this variety involves a definite number of repeated notes per beat. The measured, bowed tremolo was widely used in classical orchestral music to notate the repeated-note and repeated-chord accompaniment parts, characteristic of that period.

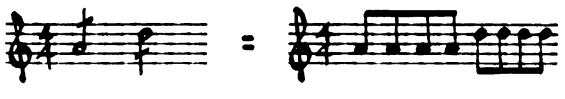
Define measured, bowed tremolo in your own words. _____

_____

A definite number of repeated notes per beat.

(Your own words.)

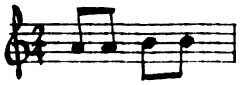
145. The measured, bowed tremolo is notated with slashes like the unmeasured, the difference being the number of slashes used. The abbreviation trem. is not used for this type. One slash indicates that a note will be subdivided into eighth notes as follows: (Except when the slash is applied to an eighth note or smaller value.) This is not really a tremolo but a much-used notation for repeated eighth notes.

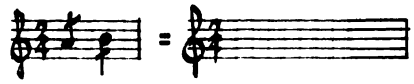


(Continued on next page.)

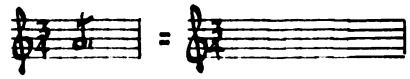
(Answer on next page.)

Following the preceding example, fill in the right-hand column with the proper number of eighth notes.

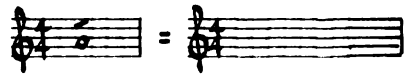
a. 

a. 

b. 

b. 

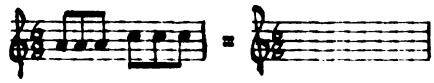
c. 

c. 

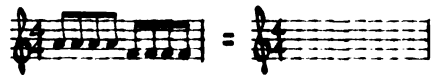
146.

In the right-hand column below, give the equivalent measured, bowed tremolo notation for the corresponding groups in the left-hand column. Use the largest note value possible for each pitch.

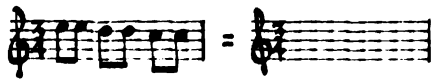
a. 

a. 

b. 

b. 

c. 

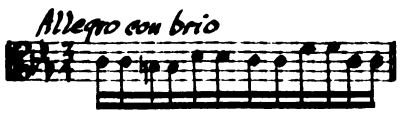
c. 

147.

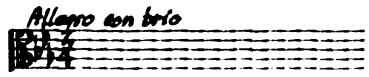
One slash through the stem of an eighth note, indicates that the eighth note is divided into two sixteenth notes.

On the staff provided, write out the actual sound of the following example:

Symphony No. 3 Beethoven



Viola 

Answer: 

148.

Using tremolo notation, write the following "written out" passage on the staff provided.

Piano Concerto No. 3 Bartok

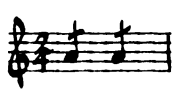
Violin 

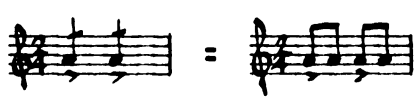
Answer: 

149.

The largest note value possible for each pitch is used unless the orchestrator wishes the individual beats clearly defined, or accented, when one pitch lasts more than one beat. Study the following examples:

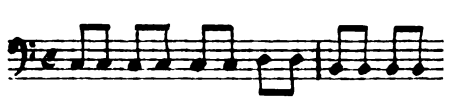
a.  ordinary eighth note tremolo

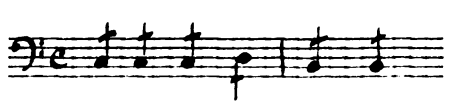
b.  each beat clearly defined

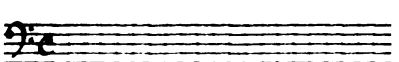
c. 

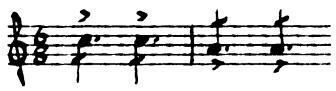
each beat accented

Notate the following "written-out" tremolo so that each beat is clearly defined.

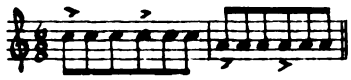
Cello 

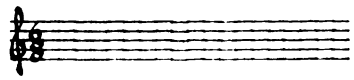


Answer: 



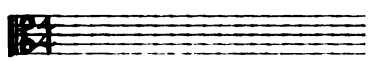
150. Notate the following "written-out" tremolo so that each beat is accented as indicated.

Violin 

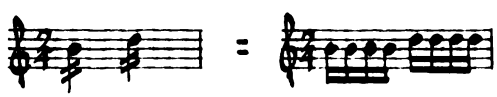
Answer: 

151. Notate the following example as an ordinary, eighth-note tremolo on the staff provided.

Viola 

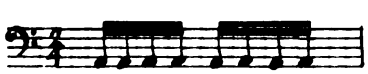
Answer: 

152. Two slashes applied to a note (except an eighth note or shorter value) indicate subdivision into sixteenth notes as follows:

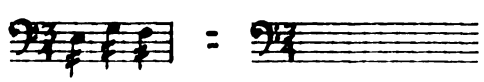


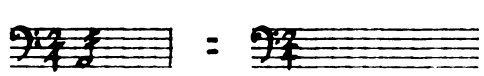
Following the above example, fill in the right-hand column below with the proper number of sixteenth notes.

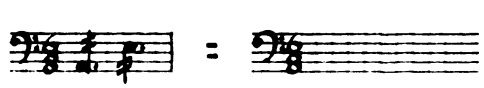
a. 

b. 

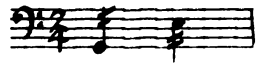
c. 

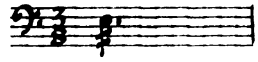
a. 

b. 

c. 

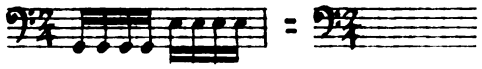
a. 

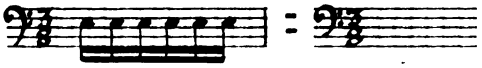
b. 

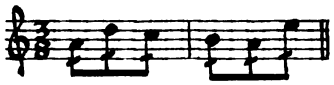
c. 

153.
In the right-hand column below give the equivalent measured, bowed tremolo notation of the corresponding groups in the left-hand column. Use the largest note value for each pitch.

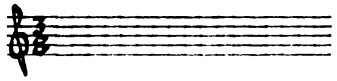
a. 

b. 

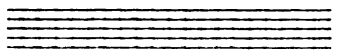
c. 



154.
Use eighth notes to notate the following written-out tremolo.

Answer: 

155.
Use quarter and eighth notes to notate the following written-out tremolo.

Answer: 

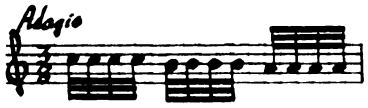
(Answer on next page.)

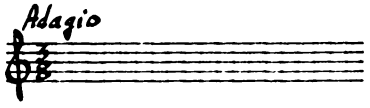
156.
Two slashes through the stem of an eighth note indicates subdivision into thirty-second notes. This would be used only at a slow tempo as in the following example:

(Continued on next page.)

Violin 

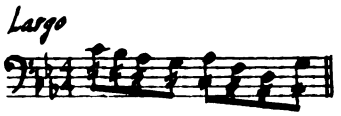
On the staff below, write out the actual note values called for in the first measure of the above example.





157. The notation in the above example is the same as for an unmeasured, bowed tremolo. To be sure that actual thirty-second notes are played, the word measured should be written above a passage notated in this manner.

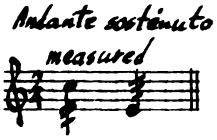
Add the proper direction to the following example to indicate that accurate thirty-second notes are desired.

Cello 

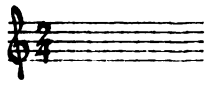
158. With values larger than the eighth note, three slashes are used to indicate subdivision into thirty-second notes. This tremolo also is useful only at a slow tempo and should be marked "measured" to avoid confusion with the unmeasured, bowed tremolo.

(Answer on next page.)

(Continued on next page.)



Write out the following passage in tremolo notation on the staff provided. Be sure to include all necessary markings.

Answer: 

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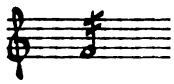
159. Place a check (✓) before the choice below which indicates a measured tremolo.

✓ a.

____ a. 

____ b. 

____ c. 

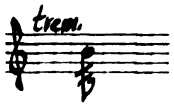
---

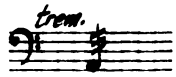
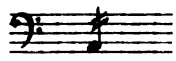
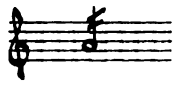
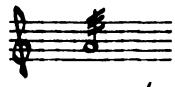
160. Place a check before the choice below which indicates an unmeasured tremolo.

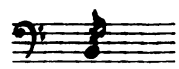
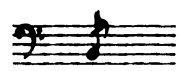
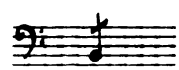
____ a. 

____ b. 

✓ c.

____ c. 

	161. Place a check before the choice below which indicates a <u>measured tremolo</u> in eighth notes. ____a.  ____b.  ____c. 
✓ b.	
	162. Place a check before the choice below which indicates a <u>measured tremolo</u> in thirty-second notes. ____a.  ____b.  ____c. 
✓ b.	
	163. Place a check before the choice below which indicates a <u>measured tremolo</u> in sixteenth notes. ____a.  ____b.  ____c. 
✓ a.	

	164. Place a check before the choice below which is only used at a slow tempo. ____a.  ____b.  ____c. 
✓ c.	
	165. Proceed as above. ____a.  ____b.  ____c. 
✓ c.	
	166. Place a check (✓) before the choice below which indicates a measured tremolo in sixteenth notes. ____a.  ____b.  ____c. 
✓ b.	

167.

Which statement below defines <u>bowed tremolo</u>?

a. Rapid alternation between two pitches.

b. Rapid reiteration of one pitch.

Answer: _____

b.

168.

The rapid alternation between two pitches is called <u>fingered tremolo</u> because the effect is achieved with the fingers of the left hand, not with the bow.

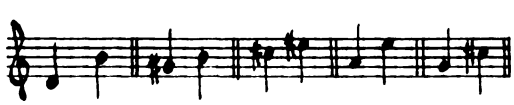
The rapid alternation between two pitches a minor or major second apart is usually called a <u>trill</u>. Therefore, we can more specifically define <u>fingered tremolo</u> as the rapid alternation between two pitches <u>more than</u> a _____ apart.
(interval)

major second

169.

The intervals most used for <u>fingered tremolos</u> are the major and minor third. However, the violin can <u>tremolo</u> intervals up to and including the tritone.

Circle those intervals in the following group that <u>can</u> be played as a <u>fingered tremolo</u> on the violin.



major (and) minor third.

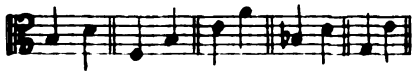
170. The intervals most used for the fingered tremolo are the _____ and _____

tritone.

171. The largest interval for a fingered tremolo on the violin is the _____

172. The largest interval practical for a fingered tremolo on the viola is the perfect fourth.

Circle those intervals below which are practical as fingered tremoli on the viola.

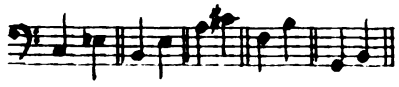
Viola 

A perfect fourth.

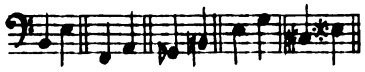
173. What is the largest interval practical for a fingered tremolo on the viola? _____

174. The largest interval practical for a fingered tremolo on the cello and double bass is a major third.

Circle those intervals in the following group which are practical for a fingered tremolo on the cello.

Cello 

175. Circle those intervals below which <u>are</u> practical for a <u>fingered tremolo</u> on the double bass.

D. B. 

major third.

176. The largest interval practical for a <u>fingered tremolo</u> on the cello or double bass is a _____

tritone.

(<u>Or equivalent.</u>)

177. The largest interval practical for a <u>fingered tremolo</u> on the violin is a _____

perfect fourth.

178. The largest interval practical for a <u>fingered tremolo</u> on the viola is a _____

major (<u>or</u>) minor third.

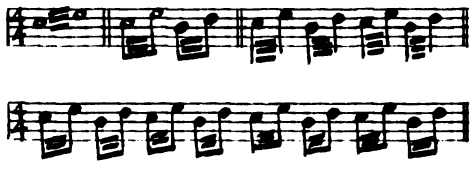
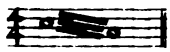
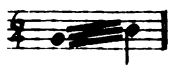
179. The interval most used for the <u>fingered tremolo</u> is the _____

or _____

(<u>Answer on next page.</u>)

180. The fingered <u>tremolo</u> is usually unmeasured and is notated in one of the following ways: (Notice that the number of slashes for each note value is the same as for the <u>unmeasured</u>, <u>bowed tremolo</u>.)

(<u>Continued on next page.</u>)

Unmeasured.	Is the <u>fingered</u> <u>tremolo</u> usually measured or unmeasured? _____
(<u>No response necessary.</u>)	181. The two note values used to indicate a <u>fingered</u> <u>tremolo</u> must <u>each</u> be equal to the duration of the <u>tremolo</u> on those particular pitches. Study the chart below. 
✓ b.	182. Place a check (✓) before the <u>tremolo</u> which is <u>rhythmically incorrect</u> in the group below. _____a.  _____b.  _____c. 
✓ c.	183. Proceed as above. _____a.  _____b.  _____c. 

✓ a.

184.

Proceed as in Frame 183.

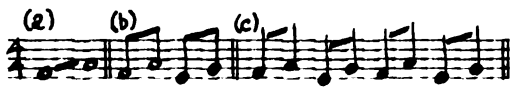
____a. 

____b. 

____c. 

185.

The fingered tremolo may be notated as a measured tremolo. (The number of slashes used is the same as for the measured, bowed tremolo of the same note value.) A measured, fingered tremolo in eighth notes may be notated in one of the following ways.



Type (c) above is really unnecessary as it differs so little from actually writing out the necessary eighth notes. Actually the eighth-note tremolo is useful only at a fast tempo as it will lose the tremolo effect at a medium or slow tempo.

Which example below may be considered unnecessary?

a.

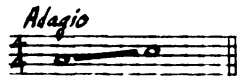
a. 

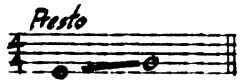
b. 

Answer: ____

b.

186. Which example below will actually result in a tremolo effect?

a. 

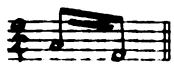
b. 

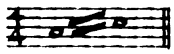
c. 

Answer: _____

✓ c.

187. Place a check (✓) before the choice below which illustrates a tremolo in eighth notes.

_____a. 

_____b. 

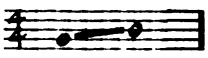
_____c. 

✓ c.

188. Proceed as above.

_____a. 

_____b. 

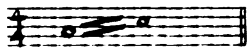
_____c. 

189.

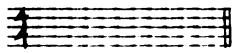
The measured, fingered tremolo in sixteenth notes is notated as follows:

This is the most useful type of measured, fingered tremolo.

Using whole notes on any two pitches, notate a fingered tremolo in sixteenth notes on the staff below.

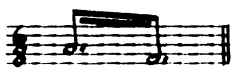


(Any two pitches.)

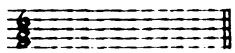


190.

Using dotted-half notes, notate a fingered tremolo in sixteenth notes on the staff below.



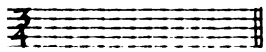
(Any two pitches.)



191.

Proceed as above using quarter notes.

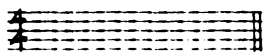
(Any two pitches.)



192.

Proceed as above using half notes.

(Any two pitches.)



193.

The measured, fingered tremolo in thirty-second notes, practical only at a very slow tempo, is notated the same as the unmeasured, fingered tremolo with the addition of the direction measured, written above the part as follows:

Under what circumstances is the measured, fingered tremolo in thirty-second notes practical? _____

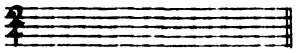
_____

At a very slow tempo.

(Or equivalent.)

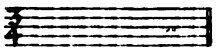
194.

Using quarter notes, notate a fingered tremolo in thirty-second notes on the staff below. Any pitches will sugfice.



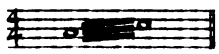
195.

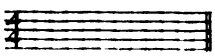
Proceed as above using dotted half notes.



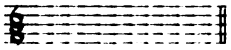
196.

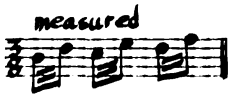
Proceed as above using whole notes.



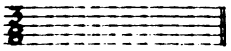


197. Proceed as in Frame 196 using dotted-quarter notes.





198. Proceed as above using eighth notes.

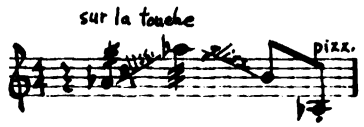


(No response necessary.)

199. Various types of tremolos are often combined with other special effects. The following excerpts illustrate a few such cases:

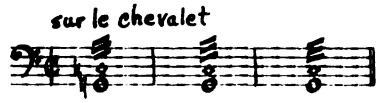
Rondes de Printemps — Debussy

a. Vln.



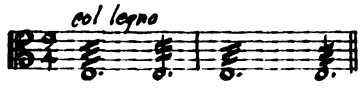
Pacific 231 — Honneger

b. Vc.



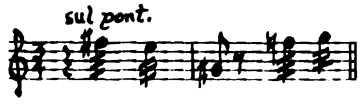
The Swan of Tuanela — Sibelius

c. Vla.



Symphony No. 2 — Sessions

d. Vln.



200. We have seen how the characteristic timbre of the stringed instruments can be changed by the way in which the bow and the fingers of the left hand are used. Another method of changing the timbre is by plucking the string with a finger rather than using the bow. This is called pizzicato. Technically there are four types of pizzicato but three of these are rarely used.

Plucking the string with a finger is called _____

pizzicato.

---

201. In the ordinary pizzicato, the right index finger plucks the string over the end of the fingerboard while the bow is held out of the way by the other fingers of the right hand. This type of pizzicato is indicated by the abbreviation pizz. written above the part as in the following example:

Classical Symphony Prokofieff

In the above example the strings are plucked with the _____ finger of the _____ hand.

index (or first)

right

202.

Pizzicato is essentially a staccato sound. The sound dies away quickly, especially on the smaller instruments (violin and viola). For longer note values, players can prolong a pizzicato sound somewhat by using vibrato.

Pizzicato is essentially a

_____ sound.

staccato.

203.

Which instrument, double bass or violin, can sustain a pizzicato sound longer?

Answer: _____

Double bass.

204.

What device is used by string players to prolong a pizzicato sound?

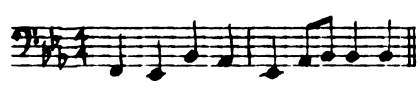
Answer: _____

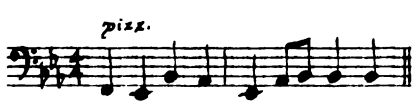
Vibrato.

205.

Mark the following passage so that a performer will pluck the strings with the right index finger.

Lieutenant Kije Prokofieff

Cello 



206. For the sake of comparison, this type of pizzicato will be called ordinary pizzicato. A string may also be plucked with one of the fingers of the left hand. This left-hand pizzicato is used when pizzicato is desired among or immediately after bowed notes, thus not allowing the player time to change his grip on the bow to play ordinary pizzicato. Left-hand pizzicato is easier on an open string, though stopped pitches may also be played in this manner.

Under what circumstances is left-hand pizzicato used?

_____

_____

When pizzicato is desired among or immediately after bowed notes.

(Or equivalent.)

---

207. Left-hand pizzicato is possible only on open strings.

(True/False) _____

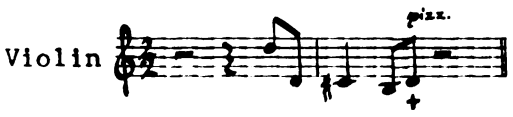
False.

(It is easier on an open string but still possible on a stopped pitch.)

---

208. The left-hand pizzicato is notated by placing a cross (+) opposite the note-stem plus the indication pizz. as in the following example:

Symphony in C Stravinsky



(Continued on next page.)

(Answer on next page.)

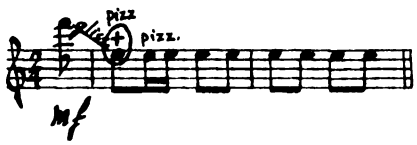
Mark the following passage so that the note B on the third beat of each measure is played as a left-hand pizzicato.

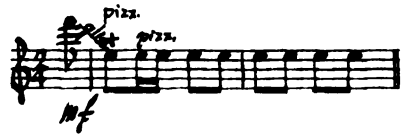
Viola 

209.

Circle the note in the following example that would be played as a left-hand pizzicato.

Symphony No. 9 Shostakovich



Violin 

210.

The left-hand pizzicato is not practical on the cello and double bass due to the greater length of their strings.

On what instruments in the left-hand pizzicato not practical?

Cello and double bass.

211.

Another type of pizzicato is the snap pizzicato. Béla Bartók is given credit for discovering this device. The snap pizzicato is executed by plucking the string with the right index finger at such an angle as to make it snap down against the fingerboard. A slapping or twanging sound of semi-definite pitch results.

In the snap pizzicato the string is snapped against the _____

fingerboard.

A slapping or twanging sound of semi-definite pitch.

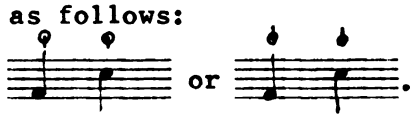
(Or equivalent.)

212. Describe the sound of the snap pizzicato. _____

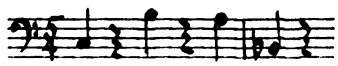
_____

_____

213. The snap pizzicato is notated as follows:



Notice that the symbol for snap pizzicato is placed above the note regardless of stem direction. Mark each note in the following example to be played with the snap pizzicato.

Cello 

(Or )

214. The snap pizzicato is a very colorful effect and is practical on all of the stringed instruments. A rapid succession of snap pizzicato notes, however, is extremely difficult if not impossible as the finger has to "get set" before each note in order to pluck the string hard enough and at the proper angle.

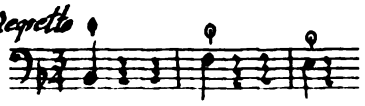
The snap pizzicato is practical on any stringed instrument.

(True/False) _____

True.

215.

Which example below illustrates an impractical use of the snap pizzicato.

(a) Cello 

(b) Violin 

(b)

Answer: _____

216.

Example (b) above is actually impossible. Why? _____

_____

_____

Because in the snap pizzicato the finger has to "get set" before each note.

(Or equivalent.)

217.

Another contribution of Bartók is the nail pizzicato. This variety is little used, perhaps because it is rather difficult. As the term nail pizzicato suggests, the string is plucked solely with the finger nail rather than with the fleshy part of the right index finger.

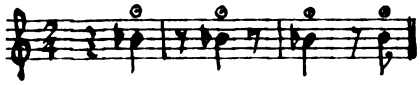
Describe how the nail pizzicato is executed. _____

_____

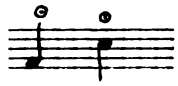
_____

The string is plucked with the finger nail of the right index finger.

(Or equivalent.)



218. The nail pizzicato produces a metallic twang. The notation is as follows:



Mark the following excerpt to be played with the nail pizzicato.

Music for String Instruments Percussion and Celesta Bartók

Violin 

A metallic twang.

(Or equivalent.)

219. Describe the sound produced by the nail pizzicato. _____

_____

No.

220. The nail pizzicato requires even more "getting set" than the snap and is appropriate only for advanced players.

Would you consider the nail pizzicato appropriate for a rapid passage? _____

False.

221. The nail pizzicato may be written for string players of any ability.

(True/False) _____

222. The nail pizzicato is possible on all of the stringed instruments. What type of pizzicato is required in the following example?

D. B. 

Answer: _____

Nail pizzicato.

---

223. What type of pizzicato is not practical on the cello and double bass? _____

_____

Left-hand pizzicato.

---

224. What type of pizzicato is required in the following excerpt?

Symphony No. 4 Diamond

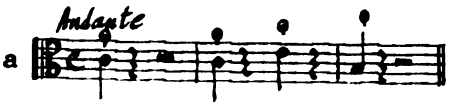
Cello 

Answer: _____

Ordinary pizzicato.

---

225. What type of pizzicato is called for in this example?

Viola 

Answer: _____

Snap pizzicato.

226. Identify the type of pizzicato required in the following passage.

Rapsodie Espagnole — Ravel

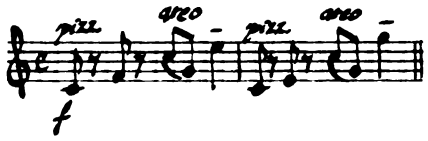
Answer: _____

Left-hand pizzicato.

---

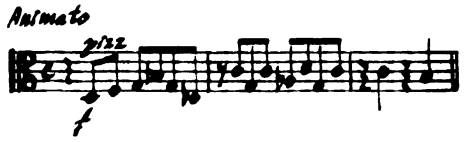
227. The direction to cease playing pizzicato is the word arco (with the bow) written above the part, as in the following example.

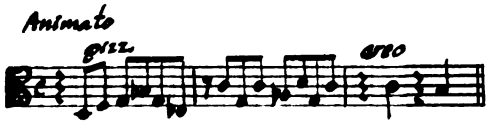
Appalachian Spring — Copland



Mark the following example so that the pizzicato will cease in the third measure.

Academic Festival Overture — Brahms





---

228. In what measure of the following excerpt does the pizzicato cease?

Symphony No. 6 — Beethoven

Answer: _____

The third measure.

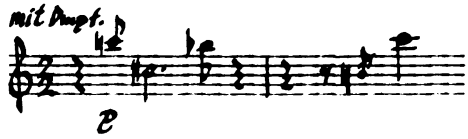
pizzicato.	229. The word arco written above a string part is used to indicate the cessation of _____
Some vibrations are absorbed before they reach the resonating body of the instrument. (Or equivalent.)	230. There is one more method of altering the basic timbre of a stringed instrument. This is by muting. Mutes are usually made of wood or metal and are fitted onto the bridge of the instrument. Their function is to absorb some of the vibrations of the strings before they reach the resonating body of the instrument. The result is a "muffled" or less vibrant, but not necessarily softer, sound. How does a mute affect a vibrating string? _____ _____ _____
False.	231. The primary function of a mute is to produce a softer sound. (True/False) _____
"Muffled" or less vibrant.	232. Describe briefly the sound produced by a muted string. _____

233. The complete Italian direction for "with mute" is con sordino. Usually the abbreviation con sord. is written above the part as in the following example:

Appalachian Spring — Copland

The German terminology, mit Dampfer, is also frequently used. The common abbreviation, mit Dmpf. is shown in the following example:

Symphonie — Webern



The Italian abbreviation for "with mute" is _____

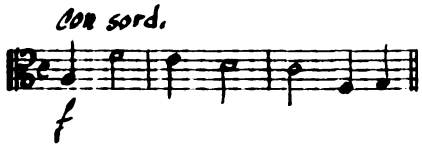
con sord.

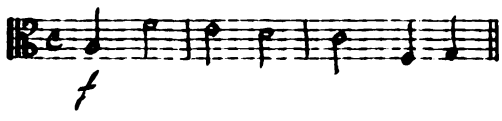
234. The German abbreviation for "with mute" is _____

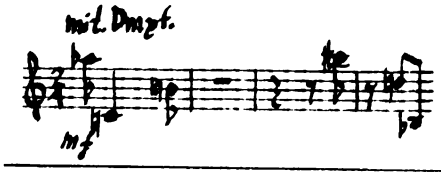
mit Dmpf.

235. Using Italian terminology, mark the following part to be played muted:

Fourth Symphony — Diamond







236. Using German terminology, mark the following passage to be played with mute.

Konzert Webern

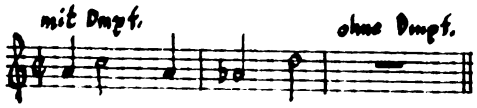
237. The abbreviated Italian term senza sord. (literally "without mute") written above the part, instructs players to remove mutes. The following example illustrates the use of this direction.

Symphony No. 4 Mahler

The abbreviated Italian term for "without mute" is

senza sord.

238. The abbreviated German term for "without mute", ohne Dmpf. is shown below.



What is the abbreviated German term for "without mute"?

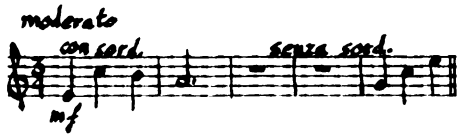
ohne Dmpf.

239.

The most important factor to remember when writing for muted strings is that it takes time to put-on or take-off mutes. A minimum of two measures at a moderate tempo should be allowed for either operation. The more time the better.

Which example below illustrates impractical writing for muted strings?

(a)



(b)

(b)

Answer: _____

---

two

240.

The minimum amount of time required to put-on or remove mutes at a moderate tempo is _____ measures.

(a) con sord.

(b) senza sord.

241.

Give the Italian directions for the following:

(a) with mutes _____

(b) without mutes _____

(a) mit Dmpf.

(b) ohne Dmpf.

242.

Give the German directions for the following:

(a) with mutes _____

(b) without mutes _____

243. One category of special effects remains to be discussed. This is the simultaneous production of two, three, or four pitches on the same instrument. This effect is called <u>multiple stopping</u>.

The simultaneous production of two, three, or four pitches on the same instrument is called

multiple stopping

---

244. This ability to perform multiple stops is unique with the stringed and some percussion instruments. The sounding of two pitches simultaniously is called a <u>double stop</u>. Three pitches constitute a <u>triple stop</u> and four a <u>quadruple stop</u>.

A <u>double stop</u> is the simultaneous sounding of _____ pitches.

two

---

245. A <u>triple stop</u> produces _____ simultaneous sounds.

three

---

246. Production of <u>four</u> pitches at the same time is called a _____ stop.

quadruple

247.

The most frequently found multiple stop is the double stop. Double stops are notated by joining the two pitches involved with a common stem as in the following example:

Cello 

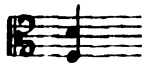
In the following group, circle those pairs of notes which are correctly notated as double stops.

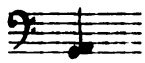
Violin 

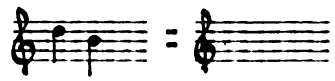
248.

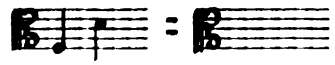
In the right-hand column below, show the proper double-stop notation for each pair of notes in the left-hand column.

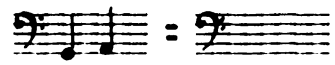
a. 

b. 

c. 

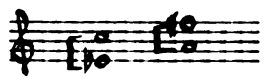
a. 

b. 

c. 

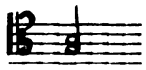
249.

In the case of whole notes, the notation of double stops is slightly different as no stems are involved. In this situation a bracket is placed to the left of the two notes, as in the following example. Note the placement of accidentals.

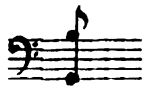


(Answer on next page.)

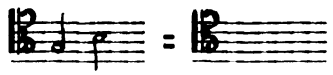
(Continued on next page.)

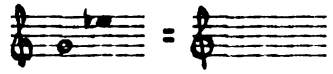
a. 

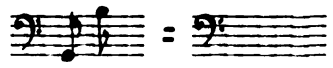
b. 

c. 

In the right-hand column below, show the proper double stop notation for each pair of notes in the left-hand column.

a. 

b. 

c. 

---

a.

250. Which example below requires the use of double stops?

a. 

b. 

Answer: _____

---

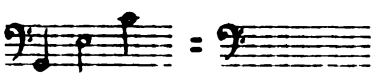
a. 

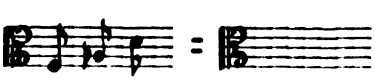
b. 

(Answer on next page.)

251. <u>Triple stops</u> may be notated in the same manner as double stops, except that three notes are involved.

In the right-hand column below, show the proper method of notating each group of notes in the left-hand column as triple stops.

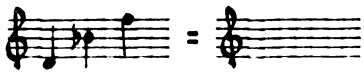
a. 

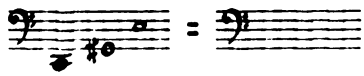
b. 

(Continued on next page.)

c. 

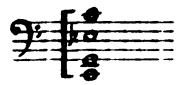
d. 

c. 

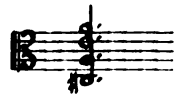
d. 

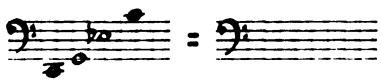
252. In the following group, circle the <u>correctly</u> notated triple-stops.

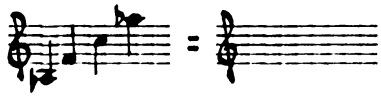
253. <u>Quadruple stops</u> are notated in the same manner as double and triple stops. In the right-hand column below, illustrate the proper quadruple-stop notation of the corresponding notes in the left-hand column.

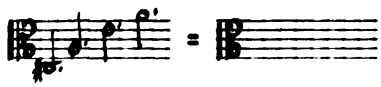
a. 

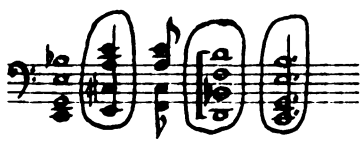
b. 

c. 

a. 

b. 

c. 



254. Circle the correctly notated quadruple stops in the following group.

inside

255. When using a bracket to indicate a multiple stop in whole notes, any necessary accidentals are spaced (inside/outside) _____ of the bracket.

256. Due to the curvature of the bridge on all stringed instruments, all of the notes in a triple or quadruple stop cannot be sounded exactly together. Instead, the notes are arpeggiated very quickly. The upper note (or two notes) may be sustained for any desired rhythmic value, but the entire chord cannot be held.

Due to the curvature of the bridge a triple or quadruple stop must be _____ quickly rather than sounding all notes simultaneously.

arpeggiated

---

257. In a triple or quadruple stop, can any note or notes be sustained? _____

Yes.

---

258. What notes may be sustained in a triple or quadruple stop?

_____

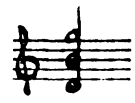
_____

The top note or the upper two notes.

(Or equivalent.)

---

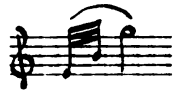
259. When the conventional notation is used, string players will generally sustain the top note for the rhythmic value notated. The following example illustrates the actual sound produced.

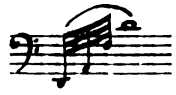
written:  played: 

(Continued on next page.)

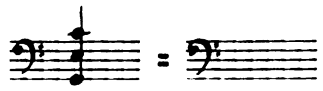
(Answer on next page.)

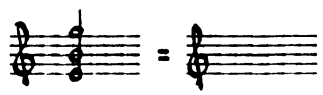
a. 

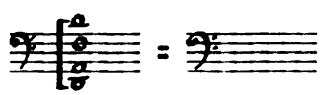
b. 

c. 

In the right-hand column below notate the actual sound of each of the multiple stops in the left-hand column.

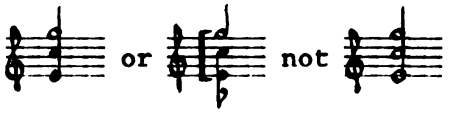
a. 

b. 

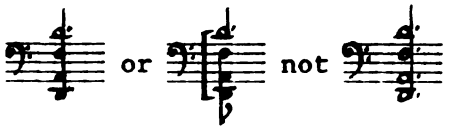
c. 

260.

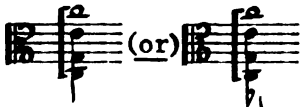
In the examples above, the notation is not at all descriptive of the sound produced, especially when larger note values are involved. The methods of notation advocated below are much more graphic.

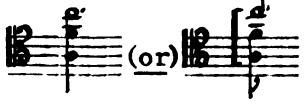
a. 

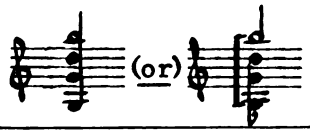
b. 

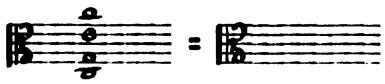
c. 

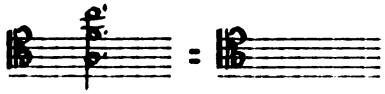
In the right-hand column below, illustrate a more graphic notation for each of the multiple stops in the left-hand column.

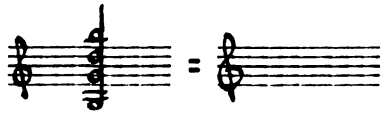
a. 

b. 

c. 

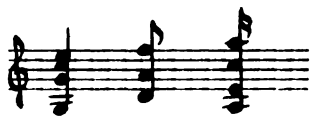
a. 

b. 

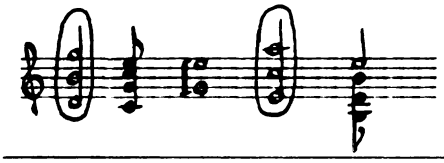
c. 

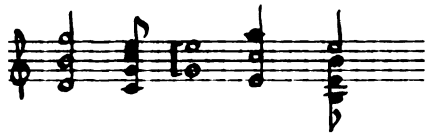
261.

In the case of quarter-note-or-smaller values the common notation for multiple stops is appropriate. Study the following example:



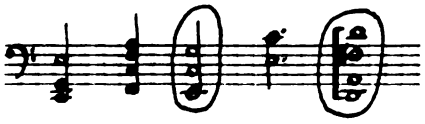
In the group below, circle those multiple stops which can best be notated in a different manner.

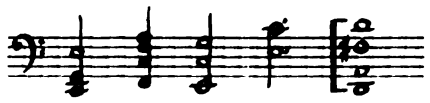




262.

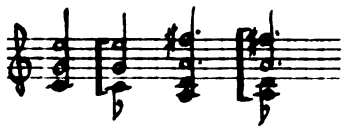
Proceed as above.



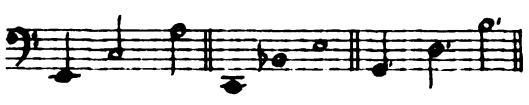


263.

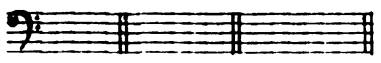
We have already mentioned the possibility of sustaining the upper two pitches of a triple or quadruple stop. This practice is used less frequently than sustaining one pitch, but is often desirable. The notation for this practice is demonstrated below:



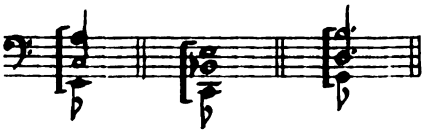
Notate the following triple stops with the upper <u>two</u> notes sustained.



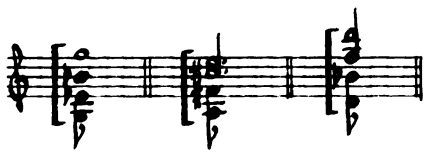
Answer:



(<u>or</u>.)

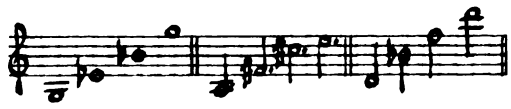


(Or.)

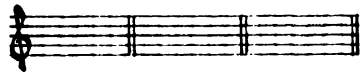


264.

Notate the following quadruple stops with the top <u>two</u> notes sustained.



Answer:



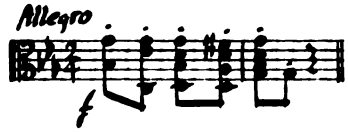
265.

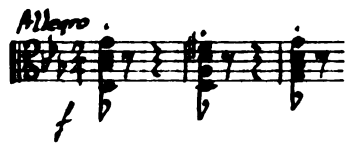
Any combination of two, three, or four notes at any point in a score is not always practical as a multiple stop. No set rules in this regard are practical as the number of possibilities is too great. Some general guidelines, however, are in order. It goes without saying, of course, that double stops are easier than triple stops, and quadruple stops are the most difficult of the three. In any case the most important consideration is the musical context of which the multiple stop is a part.

A series of multiple stops in rapid succession is impractical if not impossible, because the player must have time to get his left hand set for each succeeding multiple stop.

Which example below is impractical?

a.

a. 

b. 

Answer: ____

Because the rests permit time for the preparation of the left hand for each multiple stop.

(Or equivalent.)

266. Why is example (b) in the preceding frame practical?

_____

_____

_____

267. Another factor is also important in the example in Frame 265. Triple and quadruple stops are usually played downbow. Therefore the player must not only set his left hand for the next multiple stop, but recover the bow as well.

List two reasons why multiple stops in rapid succession are impractical.

a. The player needs time to set his left hand for each multiple stop.

a. _____

_____

_____

b. The bow must be recovered before each multiple stop.

b. _____

_____

_____

268. To insert a multiple stop in the course of any rapid single-note melody is also impractical for the reasons expressed in Frame 267.

(Answer on next page.)

(Continued on next page.)

b.

Which example below demonstrates an impractical use of multiple stops?

a. 

b. 

Answer: _____

False.

269. Multiple stops are never practical at a fast tempo. (True/False) _____

True.

270. Multiple stops require time for preparation and therefore should follow rests at a fast tempo. (True/False) _____

Because the arpeggiation of the triple stops will break the legato effect of the melody.

(Or equivalent.)

271. Attempting to incorporate the upper note of a triple or quadruple stop into a legato melodic line is also impractical. The fact that a triple or quadruple stop must be arpeggiated will, of course, destroy the legato effect of the melody.

Why does the following example demonstrate an impractical use of multiple stops?

Answer: _____

_____

_____

True.

272. Attempting to incorporate the upper note of a triple or quadruple stop into a legato melodic line is impractical.

(True/False) _____

273. The pitches of any multiple stop must be available on separate but adjacent strings. Consider this double stop:

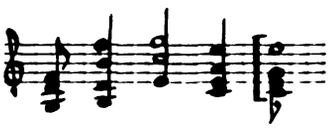
Both of these pitches are available only on the C string of the cello. Therefore, it is an impossible double stop.

Circle the impossible double stops in the following group:

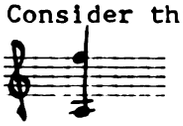
Viola 

274. This principle also applies to triple and quadruple stops.

Circle the impossible multiple stops in the following group:

Violin 

275. The basic principle here is that each pitch of a multiple stop must be available on separate but adjacent strings. Consider this double stop:



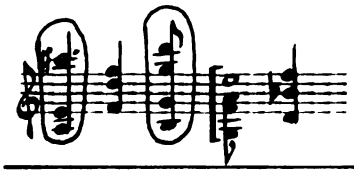
(Answer on next page.)

(Continued on next page.)

The two pitches required are possible on the G and D strings of the violin but certainly not available simultaneously to any player with less than a super-human left hand.

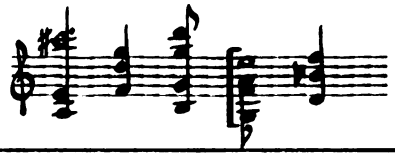
Circle the double stops in the following group which are not available on adjacent strings:

Cello 



276. This principle also applies to triple and quadruple stops.

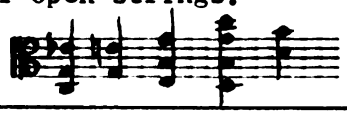
Circle the impractical multiple stops in the following group:

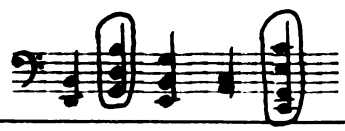
Violin 

separate (but) adjacent

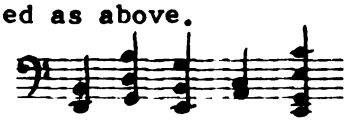
277. Each pitch of a multiple stop must be available on _____ but _____ strings.

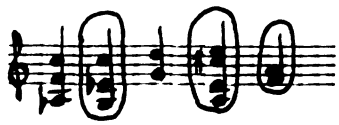
278. The most playable multiple stops are those which incorporate as many open strings as possible. Circle the multiple stops below which make use of open strings.

Viola 



279. Proceed as above.

Cello 



280. Proceed as above.

Violin 

281.

Naturally the more open strings involved, the better. The use of an open string even makes possible many compound intervals. You discovered earlier that this interval;

 , is impossible as a double stop on the violin, because the left hand cannot reach both notes simultaneously. But this interval;

 , is completely practical because only the "e" is a stopped pitch.

A. Any compound interval is possible as a double stop.

B. Compound intervals involving one open string are possible as double stops.

Check (✓) the choice below which best evaluates the above statements.

_____a. A is true.

✓ b.

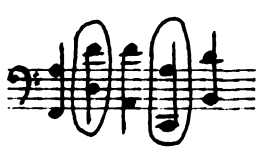
_____b. B is true.

_____c. Both are true.

_____d. Both are false.

282.

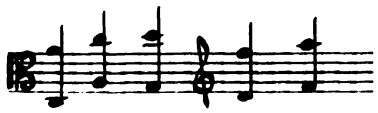
Circle the compound intervals in the group below which <u>are</u> practical as double stops.



Cello 

283.

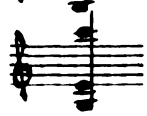
Proceed as in Frame 282.

Viola 

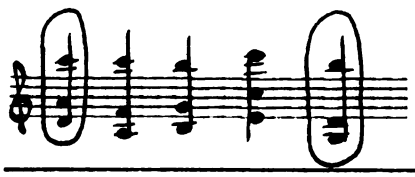
284.

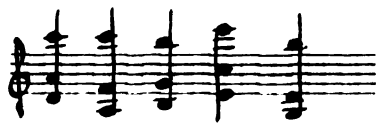
The principle exemplified in the preceding frames also applies to triple stops involving two open strings, as in the following examples:

Possible 

Impossible 

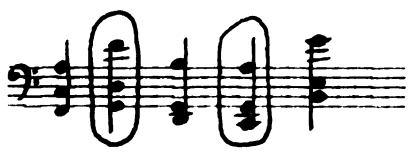
Circle the practical triple stops in the following group:



Violin 

285.

Proceed as above.



Cello 

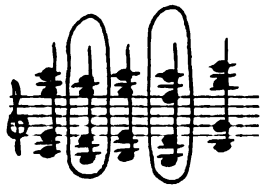
286.

Quadruple stops involving compound intervals are rarely found. They may be used, however, if the lower two strings are unstopped as in this chord:

Cello 

(Answer on next page.)

(Continued on next page.)



Circle the playable quadruple stops in the following group.

Violin 

two lower

287. Quadruple stops containing compound intervals must leave at least the _____ strings unstopped.

Because it is easier to hear when they are out of tune.

(Or equivalent.)

288. Some general guidelines may be stated concerning specific intervals as practical double stops. The perfect intervals present the greatest intonation problems because it is easier to hear when they are out of tune. The most troublesome of this group, is the perfect fifth.

Why do the perfect intervals, present the greatest intonation problems as double stops?

_____

_____

perfect fifth

289. The most troublesome interval in terms of intonation is the

_____

	290. To produce a perfect fifth as a double stop, the same finger must stop two adjacent strings. This is not difficult in itself, but there is no way to correct faulty intonation of one pitch without changing the other as well. The intonation of a perfect fifth as a double stop is almost impossible to correct, because the _____ finger stops two adjacent strings.
same	
	291. The perfect octave and the perfect fourth as double stops, are somewhat safer intonation-wise, because they can at least be adjusted as two fingers are involved in producing them. Place a check (✓) before the interval below, which does not permit intonation adjustment when played as a double stop. _____a. Perfect octave. _____b. Perfect fourth. _____c. Perfect fifth.
✓ c.	
	292. In spite of the fact that the perfect octave and the perfect fourth are possible as double stops, with good intonation, their use should be reserved for performers with well-trained ears.
(No response necessary.)	

293.

Double-stopped unisons are occasionally used when greater volume or resonance are desired. They almost always involve an open string. The following example illustrates the use of the double-stopped unison combined with tremolo.

Chout Prokofieff

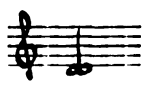
Vln. I 

A double-stopped unison may be used to produce greater _____ or _____

volume (or) resonance.

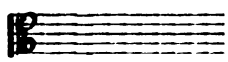
294.

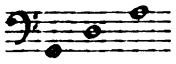
Since double-stopped unisons almost always involve one open string, they are most practical on the pitch of one of the upper three strings of the instrument. In this situation:



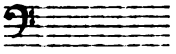
the violinist fingers D on the G string and draws the bow across the G and D strings.

On the staff below, notate the three most practical pitches for double-stopped unisons on the viola.

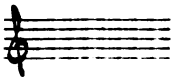




295. On the staff below, notate the three most practical pitches for double-stopped unisons on the cello.



296. Notate the three most practical pitches for double-stopped unisons on the violin on the staff below.



sixth

297. The imperfect intervals (major and minor) may be ranged from easiest to most difficult as follows: sixths, thirds, sevenths, seconds.

The easiest imperfect interval to play as a double stop, is a major or minor _____

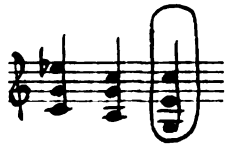
second

298. The most difficult imperfect interval to play as a double stop, is a major or minor _____

less

299. Thirds are (more/less) _____ difficult than sevenths as double stops.

True.	300. Thirds are more difficult than sixths as double stops. (True/False) _____
less	301. Sevenths are (more/less) _____ difficult than seconds as double stops.
False	302. Thirds are more difficult than seconds as double stops. (True/False) _____
a. sixths b. thirds c. sevenths d. seconds	303. In the right-hand column below, rank the intervals given in the left hand column in order of difficulty. Begin with the <u>easiest</u>. a. thirds a. _____ b. seconds b. _____ c. sixths c. _____ d. sevenths d. _____
(<u>Answer on next page.</u>)	304. In discussing the relative practicality of triple and quadruple stops, one must necessarily be less inclusive due to the far greater number of combinations possible. The advisability of using as many open strings as possible has already been discussed. Beyond that it is sufficient to say that when only <u>stopped</u> strings are involved, chords of superimposed major and/or minor sixths are most practical in terms of both intonation and technical facility. (<u>Continued on next page.</u>)



Circle the triple stop below which is most practical considering both intonation and technical facility.

violin 

305.

Circle the quadruple stop in the group below which is most practical in terms of intonation and technical facility.

Viola 

306.

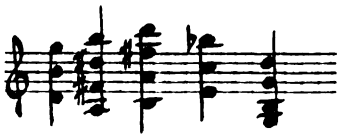
For multiple stops containing no open strings, chords of superimposed major and/or minor _____ are most practical in terms of intonation and technical facility.

sixths

307.

Somewhat more difficult but still practical are <u>triple stops</u> with no open note, combining the intervals of a major or minor sixth and a <u>minor</u> seventh. <u>Quadruple stops with no open note containing sevenths are not recommended</u>.

Circle the <u>impractical</u> multiple stops in the following group.



B.

308.

A. Triple or quadruple stops with no open note containing the interval of a minor seventh are equally practical.

B. Only triple stops with no open note containing a minor seventh are recommended.

Which statement above is true?

_____

---

b.

309.

Which multiple stop below is easier?

a. 

b. 

Answer: _____

Yes.

310.

Are both examples in Frame 309 practical? _____

311.

Triple and quadruple stops containing a perfect fifth along with one or two sixths, are the easiest type in terms of technical facility, but are the most difficult in terms of intonation.

(Answer on next page.)

(Continued on next page.)

a.

The intonation problems are somewhat less acute, however, than with the double-stopped perfect fifth, as the accompanying sixths tend to obscure faulty intonation of the fifth to some extent. These multiple stops should not be used to excess, however, just because they are possible.

Which multiple stop below, possesses greater intonation problems?

a. 

b. 

Answer: _____

Because the accompanying sixth tends to obscure faulty intonation in the fifth.

(Or equivalent.)

312. Why are the intonation problems less severe in (b) above?

_____

_____

_____

False.

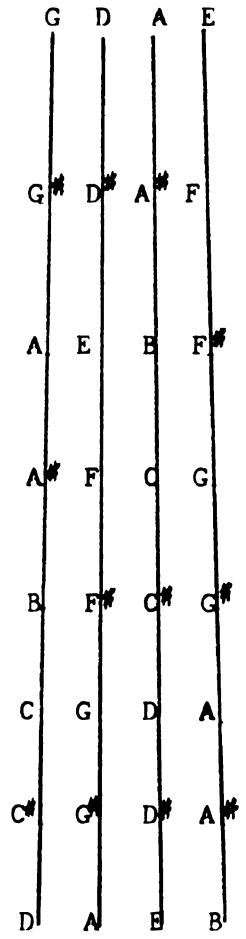
313. Multiple stops containing perfect fifths, may be considered equally practical with those containing only sixths. (True/False) _____

314.

This discussion has not, of course, included all of the possible multiple stops as the list is practically endless. The question remains then, "How can I find out what other combinations are possible or practical?" The best source of information is the accomplished performer on the instrument in question. At times when such consultation is not possible, the following chart may prove helpful.

(No response necessary.)

This is an accurate full-scale drawing of a portion of a violin fingerboard. The pitches are indicated as closely as possible to the point where they are stopped. By studying this chart or by actually holding it in your left hand in playing position, you can get some idea of the difficulty of various multiple stops.



a.

315. Multiple stops which place the left hand in a more natural position, that is with the lower-numbered fingers on the lower-pitched strings, are less difficult to produce. In view of this factor, which multiple stop below is easier to produce? (Consult the chart in the preceding frame if you wish.)

a. 

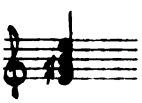
b. 

Answer: _____

---

b.

316. Proceed as above.

a. 

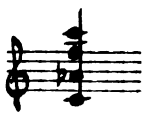
b. 

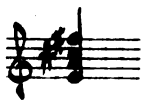
Answer: _____

---

a.

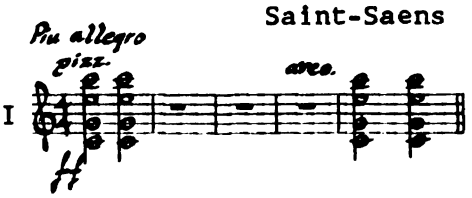
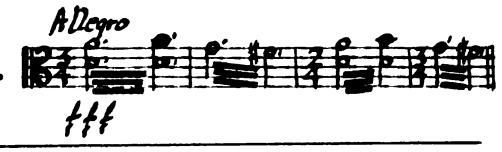
317. Proceed as above.

a. 

b. 

Answer: _____

lower	318. The natural position of the left hand places the lower-numbered fingers over the _____ - pitched strings.
(No response necessary.)	319. Charts similar to the one in Frame 314 may be made for the other stringed instruments as well, but computing the actual distance between pitches is a rather lengthy process. A better solution is for the orchestrator actually to hold the instrument in his hands and experiment with various combinations himself.
False.	320. The double bass has been noticeably avoided in this discussion of multiple stops. Triple and quadruple stops are not practical on this instrument. Double stops having one or two open strings are practical technically speaking, but usually do not sound effectively in the pitch register of the double bass. Some triple and quadruple stops are practical on the double bass. (True/False) _____
Those having one or two open strings. (Or equivalent.)	321. What double stops are technically practical on the double bass? _____
True.	322. Aesthetically speaking, double stops do not sound effectively in the pitch register of the double bass. (True/False) _____

(No response necessary.)	323. Multiple stops, of course, may be combined with other special effects as illustrated in the following examples: Carnival of the Animals Saint-Saens  Petrouchka Stravinsky 
False.	324. Some general guidelines may be expressed concerning multiple stops for high school string players. Double stops having one or two open strings are practical for all instruments, <u>except</u> double bass, at a slow or moderate tempo. Double stops having one or two open strings, are practical for all instruments of a high school string section. (True/False) _____
Double bass.	325. What stringed instrument should not be given double stops in a high school orchestra? _____ _____
slow (<u>or</u>) moderate	326. Double stops having one open string are practical for high school violinists, violists, and cellists at a _____ or _____ tempo.

Violins and violas.

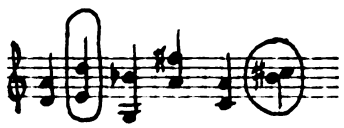
327. Double-stopped thirds and sixths with both notes stopped, are practical for high school violinists and violists at a slow or moderate tempo.

For what instruments of the high school string section are double stops containing no open note practical? _____

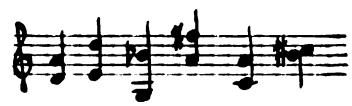
_____

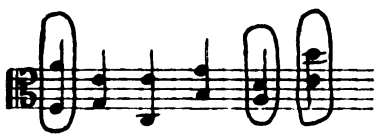
thirds (or) sixths.

328. Double stops containing no open note should be limited to _____ (interval) or _____ (interval) for high school violinists or violists.

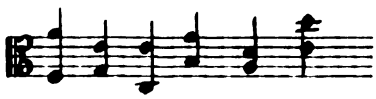


329. Circle the double stops in the following group that are not practical for high school orchestras.

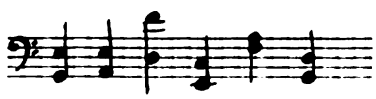
Violin 

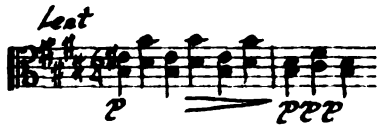
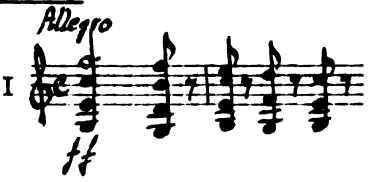


330. Proceed as above.

Viola 

331. Proceed as above.

Cello 

open	332. Double stops for high school cellists should be limited to those having at least one _____ string.
b.	333. Which example below is appropriate for high school orchestra? Roman Carnival Berlioz a. Vln. I  Symphony No. 36 Mozart b. Vla.  Answer: _____
(Answer on next page.)	334. Study the following examples in terms of their practicality for high school orchestra. Sheherazade Ravel a. Vla.  Fifth Symphony Beethoven b. Vln. I  (Continued on next page.)

	Check the choice below which best evaluates the preceding examples in terms of high school musicians. _____a. (a) is practical. _____b. (b) is practical. _____c. Both are practical. _____d. Neither is practical.
✓ d.	
	335. The primary purpose of multiple stops is to achieve greater volume and resonance when scoring for added voices. When sheer volume is not a requirement, parts scored <u>divisi</u> (divided) are technically easier than multiple stops. Multiple stops are used primarily to achieve greater _____ and resonance when scoring for added voices.
volume	
	336. The Italian term <u>divisi</u> indicates that the multiple voice parts are to be "divided" among the players in the section rather than played as multiple stops. The Italian term for "divided" is _____
<u>divisi</u>	

337.

The abbreviation for divisi is div. This abbreviation may be written above the staff when a section is to be divided into two voices as in the following example:

Fêtes — Debussy

Vln. II 

Divisi is indicated by writing the abbreviation _____ above the staff.

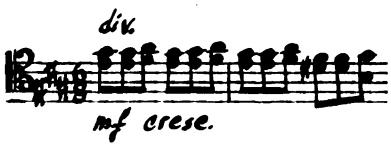
div.

338.

Mark the following example to be played divisi.

Roman Carnival — Berlioz

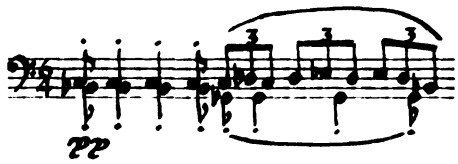
Vc. 



339.

The method of indicating divisi illustrated in the preceding frame cannot be used if the rhythm of the two voices is different. In such cases separate note-stems are required and the direction div. may be omitted. Study the following example.

Pelléas et Mélisande — Debussy

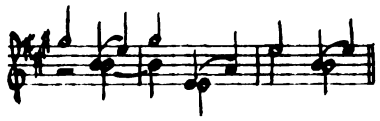
D. B. 

(Answer on next page.)

(Continued on next page.)

rhythm

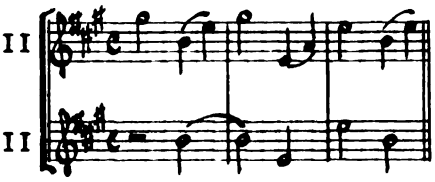
Separate stems are required in the preceding example because the _____ of the two voices is different.



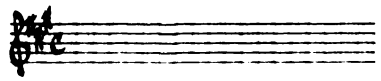
340.

On the staff provided, score the two parts below as one <u>divisi</u> part.

<u>Appalachian Spring</u> Copland



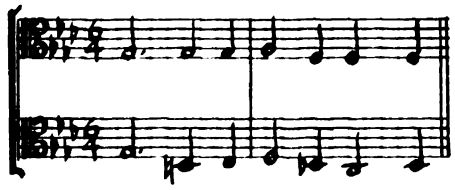
Answer:



341.

Are separate stems needed to score the following two parts as one <u>divisi</u> part?

<u>Prelude to Parsifal</u> Wagner



No.

Answer: _____

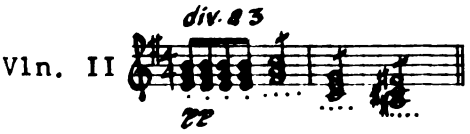
342.

A multiple <u>divisi</u> of three or four parts is also possible. The abbreviation <u>div. a 3</u> indicates a <u>divisi</u> of three parts. The abbreviation is placed above the staff as in the following example.

(<u>Answer on next page.</u>)

(<u>Continued on next page.</u>)

Symphony No. 4 Mahler

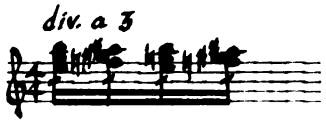


The above example illustrates a multiple divisi of _____ parts.

three

---

343. Mark the following excerpt to be played as a divisi of three parts.



Piano Concerto No. 3 Bartok

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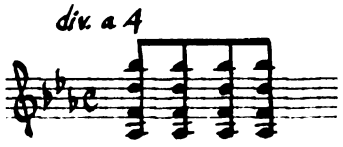
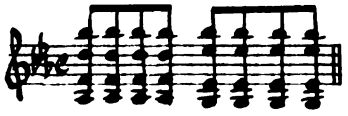
344. Divisi into four parts is indicated by the abbreviation div. a 4 above the staff. Mark the following example to be played as a divisi of four parts.



Vln. 

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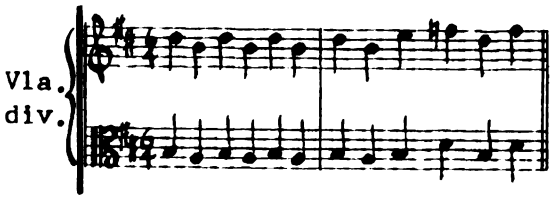
345. It is often necessary to use more than one staff for divisi parts, especially when a multiple divisi is being scored. This practice will prevent one staff from becoming unduly cluttered and is absolutely necessary when two different clefs are involved as in the following example.

(Answer on next page.)

(Continued on next page.)

Nuages — Debussy



Notice the brace (to the left of the bracket) joining the two staves for the violas.

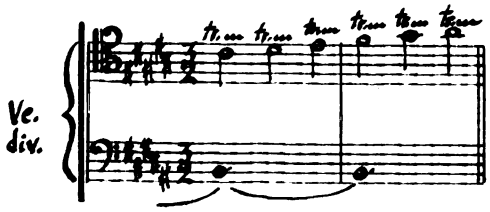
The abbreviation div. in the example above is placed (below/above) _____ the abbreviation for viola.

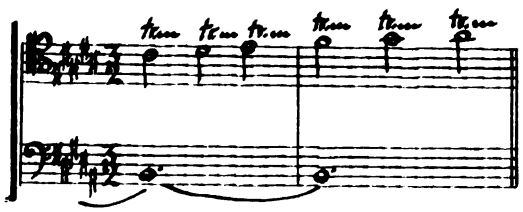
below

346.

Add the necessary brace and labels to the following excerpt for divided cellos.

Firebird Suite — Stravinsky





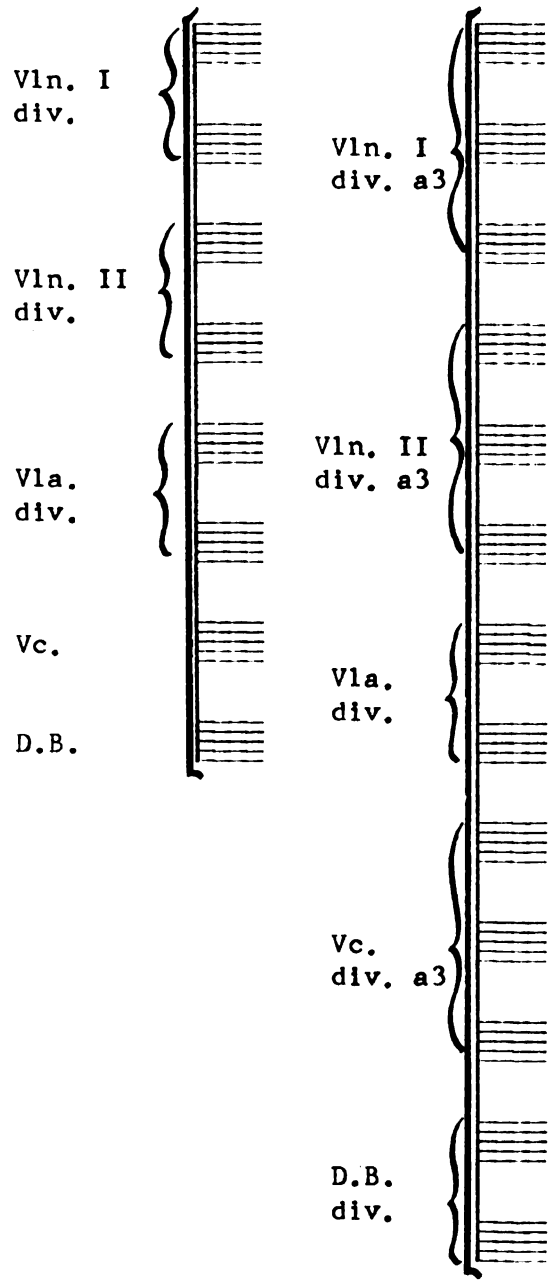
347.

The examples on the following page illustrate two different score arrangements for divisi strings. There are of course as many such arrangements as there are ways of dividing the instruments of the string orchestra. These two are offered only as models.

(Answer on next page.)

(Continued on next page.)

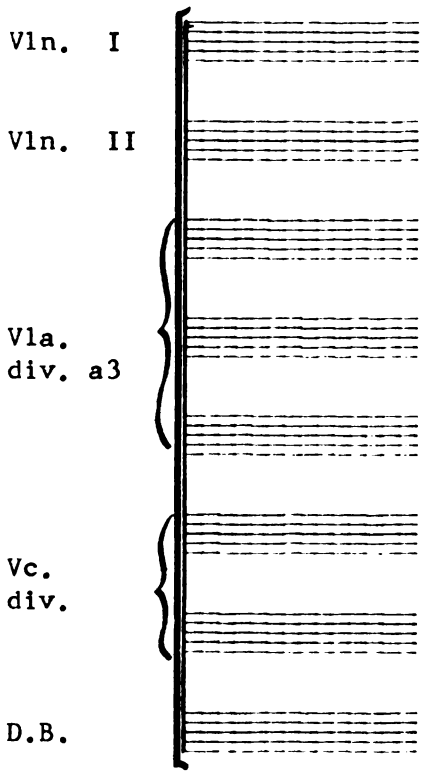
(No response necessary.)



348.

Using separate staves for each <u>divisi</u> part, set up the blank score below for the following instrumentation:

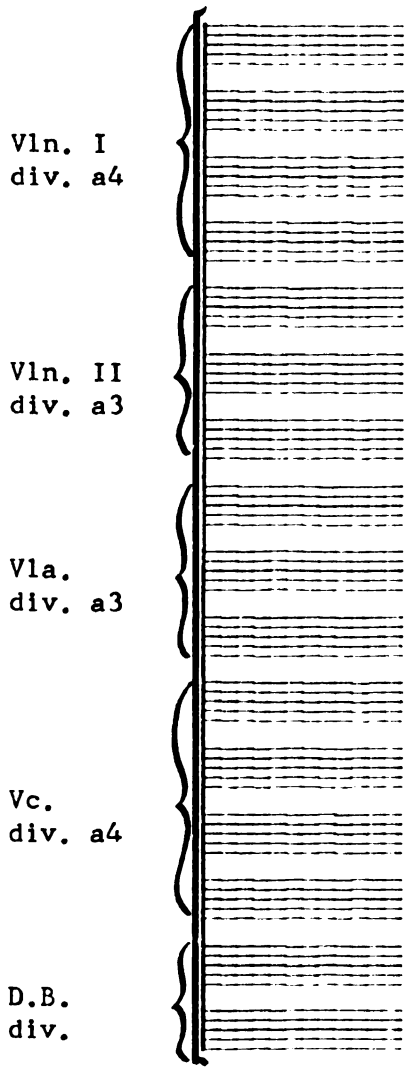
First Violins
Second Violins
Violas, div. a3
Cellos, div.
Double Basses

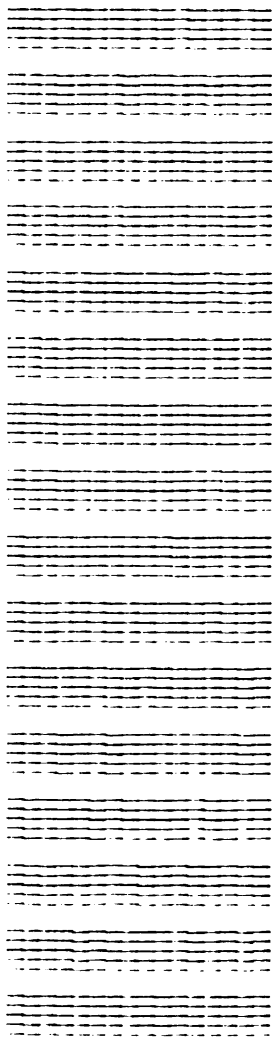


349.

Using separate staves for each <u>divisi</u> part, set up the blank score below for the following instrumentation:

First Violins, div. a4
Second Violins, div. a3
Violas, div. a3
Cellos, div. a4
Double Basses, div.





Summary

Many so-called special effects which deviate from the normal timbre and manner of playing are possible on the stringed instruments. Most of these effects are called for quite frequently, although not constantly, in string writing and for this reason are not as "special" as the traditional term "special effects" implies.

Harmonics are simply the sounding of partials of the overtone series without the presence of the fundamental. They are soft and flute-like in timbre. A natural harmonic is an overtone of an open string while an artificial harmonic is an overtone of a stopped fundamental. The latter type is somewhat more difficult to play and usually only the pitch two octaves above the fundamental is requested.

The direction sul tasto (Fr. sur la touche, Ger. am Griffbrett) means that the strings are bowed over the fingerboard rather than at the normal place. The sound of sul tasto is usually associated with a soft dynamic level and lacks the "edge" of a normal string tone. By drawing the bow across the strings either over or right near the bridge, a different sound is produced. This effect is called sul ponticello (Fr. an chevalet, Ger. am Steg) and produces a soft and thin or "glassy" sound. The bow stick rather than the hair makes contact with the string when col legno is called for. The stick may either bounce against the string (col legno batutto) to produce a clicking sound, or be drawn across the string (col legno tratto) producing a mere dry whisper of sound.

A glissando is produced on a stringed instrument by sliding the finger along a string while pressing it against the fingerboard. A smooth sliding or "swooping" sound results. A less noticeable and more sudden slide is called a portamento. This effect may be notated in the score and parts but in many cases is simply added by the players where a more "romantic" legato seems appropriate.

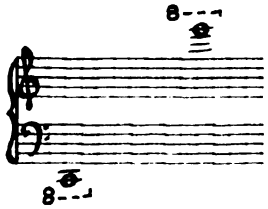
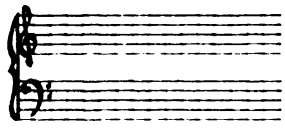
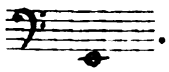
The rapid reiteration of one pitch is called bowed tremolo. The rapid alternation between two pitches is called fingered tremolo. Either type may be measured or unmeasured. The unmeasured, bowed tremolo is a frequently used effect which produces a "shimmering" sound. This tremolo is often used in combination with sul ponticello.

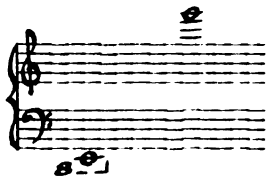
Plucking the strings with the finger is called pizzicato. This effect is usually produced with the right index finger but the left hand may also be used. Bela Bartok was responsible for two unusual types of pizzicato. These are snap pizzicato which is executed by lifting the string high enough to cause it to "snap" against the fingerboard, and the nail pizzicato which is executed with the fingernail. The cessation of pizzicato is indicated by the word arco.

A less vibrant, but not necessarily softer, sound may be achieved by using mutes. The indication con sord. directs players to "put on mutes." Senza sord. indicates the removal of mutes. A miminum of two, four-four measures of rest at a moderate tempo (or equivalent) should be allowed for either "putting on" or removing mutes.

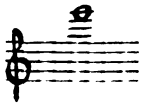
Although the normal manner of playing stringed instruments produces only one pitch at a time, the simultaneous production of two, three, or four pitches is possible. These *double*, *triple*, and *quadruple stops* are easier to play when notated so that as many open strings as possible are employed. In cases where practical *multiple stops* are not possible, *divisi* writing may be used. *Divisi* means that one half of a section plays a different part than the other half. *Divisi a 3* (in three parts) and *a 4* (four parts) are also possible. More than four parts are infrequent but possible if one is scoring for an extremely large orchestra.

One final possibility regarding these special effects is that many combinations such as the *tremolo sul ponticello* already mentioned are available. The *glissando in harmonics*, *tremolo col legno*, *muted pizzicato*, and *tremolo glissando* are only some of the possibilities.

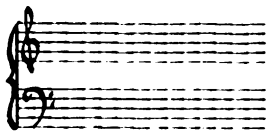
(No response necessary.)	1. There are several factors which make scoring for string orchestra a most satisfying task. The pitch and dynamic ranges are extensive. Through the use of special effects many varied timbres are possible. The technical versatility and endurance of the stringed instruments have no peer and the problems of blend are fewer than in any other instrumental family.
	2. Some difference in overall pitch range exists between the professional and high school string section or string orchestra. Most professional orchestras include double basses with extensions enabling them to play down to written  . The practical upper limit for professional calibre violinists is  . On the great staff below, notate the overall sounding range of the professional string orchestra. 
(Answer on next page.)	3. The high school orchestra, as a rule, does not use the extended double bass thus limiting its lower written range to  . (Continued on next page.)



The practical upper limit for high school violinists is



On the great staff below, notate the overall sounding range of the high school string orchestra.



(No response necessary.)

4.

In scoring for the entire string family, the practical limitations for players of varying abilities expressed in the preceding six chapters must, of course, be observed. Refer to these chapters, if necessary, concerning any specific problem which may arise.

a. Vln. I

b. Vln. II

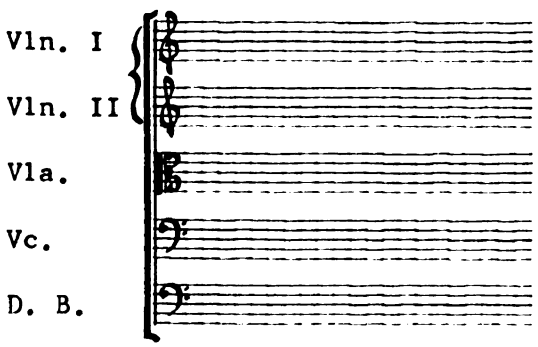
c. Vla.

d. Vc.

e. D. B.

5.

There are five sections within the string orchestra: first violins, second violins, violas, cellos, and double basses. The modern standard string orchestra score is set up as follows:



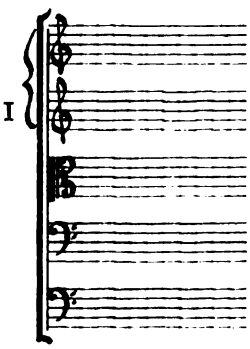
With abbreviations, list the five sections of the string orchestra on the lines below.

a. _____ d. _____

b. _____ e. _____

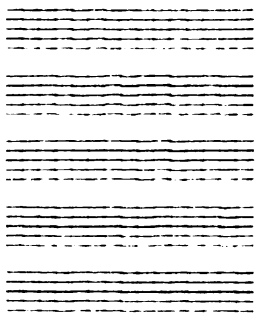
c. _____

Vln. I
Vln. II
Vla.
Vc.
D. B.



6.

Add the necessary labels, bracket, brace, and clef signs to the staves below to illustrate the setup of a modern string orchestra score.

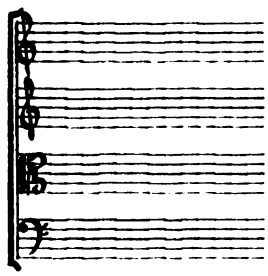


(No response necessary.)

7.

In classical orchestral music (including string orchestra) the basses usually doubled the cellos at the octave below, that is, both sections played the same written part. For this reason, classical scores for string orchestra often employ only four staves set up as follows:

Vln. I
Vln. II
Vla.
Vc. and D. B.



(Answer on next page.)

8.

Scoring for string orchestra may be studied in terms of the three basic musical textures: monophonic, homophonic, and polyphonic. We shall define these textures and examine them in terms of their use in providing each of the two basic components of a good score: unity and contrast.

(Continued on next page.)

On the lines below, list the three basic musical textures.

a. Monophonic.

b. Homophonic.

c. Polyphonic.

a. _____

b. _____

c. _____

---

unity (and) contrast

(Any order.)

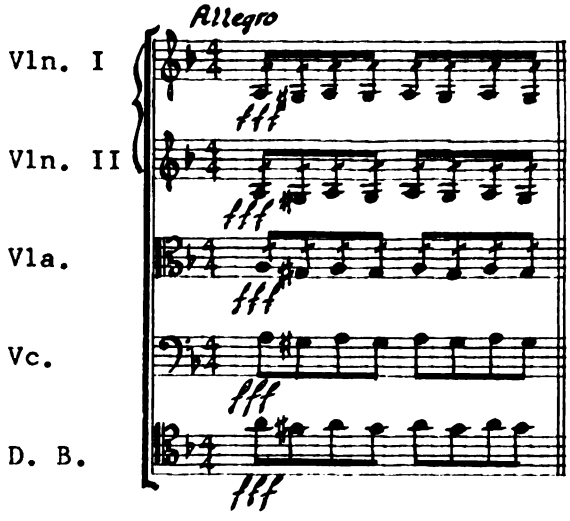
9. The two basic components of a good score are _____ and _____.

A texture of only one musical element.

(Or equivalent.)

10. The simplest musical texture is a texture of only one element. This is called a monophonic texture and may be employed in either of two ways. The first of these is the unison demonstrated below.

Variations on a Theme of Frank Bridge — Britten



Define monophonic texture. _____

_____

monophonic

11.
The unison is one way of employing a _____ texture

Vibrant and forceful.

12.
The sound of the unison is vibrant and forceful, especially at the dynamic level of the example in Frame 10. There are two reasons for this. The first is simply the large number of instruments playing the same pitch. The second reason is the difference of timbre produced by the various instruments. The violins are on the dark and resonant G string; the violas and cellos are in the middle area of their range; and the basses are using the more nasal upper region of their range.

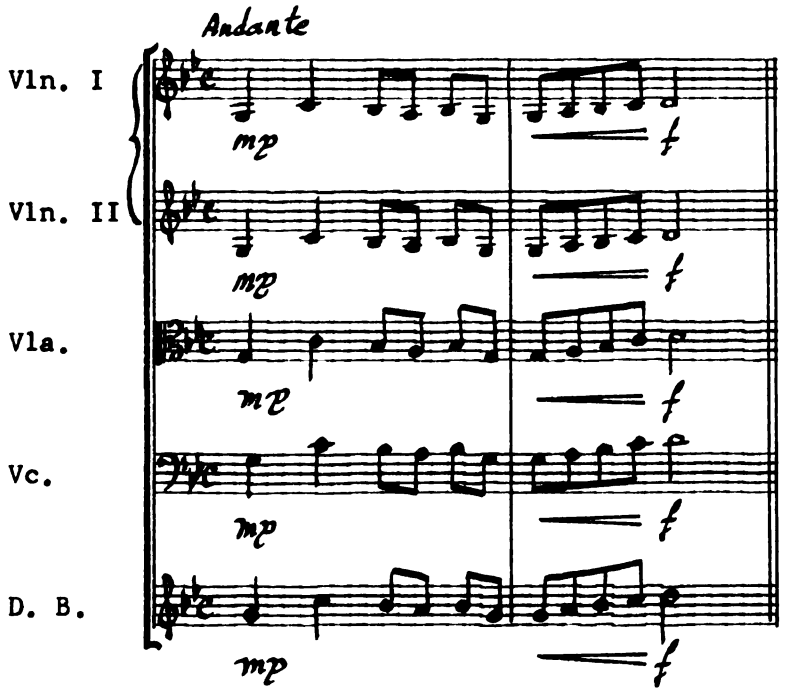
Describe briefly the sound of the unison. _____

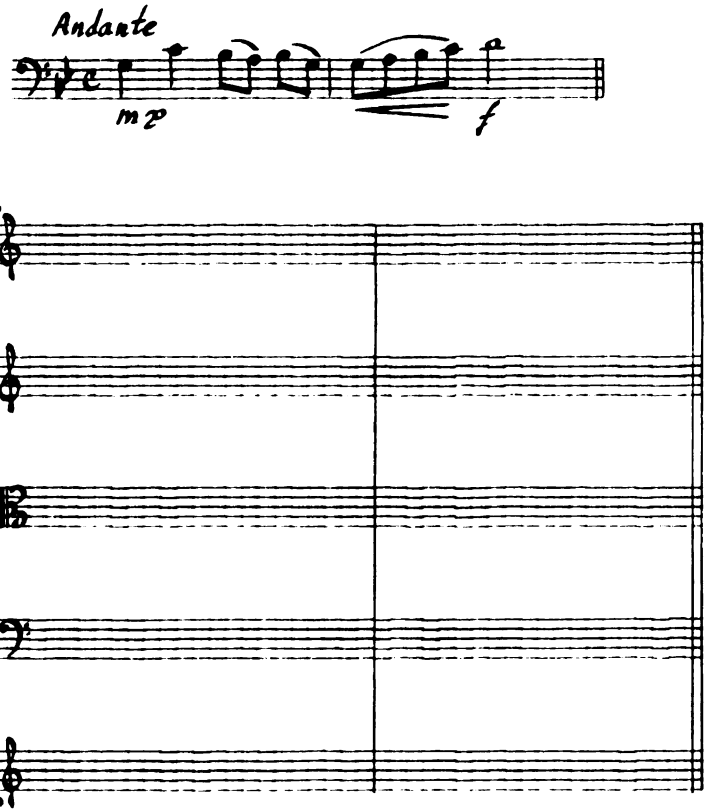
(Answer on next page.)

13.
In the example in Frame 10, the unison provides unity at a point which is generally cadential. It also places this portion of the composition in contrast to what has come before.

Score the following line as a unison on the staves provided. Indicate dynamics and articulation for each part. The tempo is indicated only above the first violin part.

(Continued on next page.)


Andante
Vln. I
Vln. II
Vla.
Vc.
D. B.
mp
f


Andante
mp
f
Vln. I
Vln. II
Vla.
Vc.
D. B.

Below each part.

14. Where are the dynamics and articulation indicated in a string orchestra score? _____

Above the first violin part.

15. Where is the tempo indication placed in a string orchestra score? _____

_____

unison (and) octave doubling.

(Any order.)

16. The string unison is seldom used for one important reason: only a small portion of the practical ranges of the violin and double bass overlap.

Because of this diversity of instrumental ranges it is easier for the string orchestra to play the same part in octaves rather than in a true unison. Playing the same part in octaves is called octave doubling and is the second method of employing a monophonic texture.

The two types of monophonic texture are _____ and _____

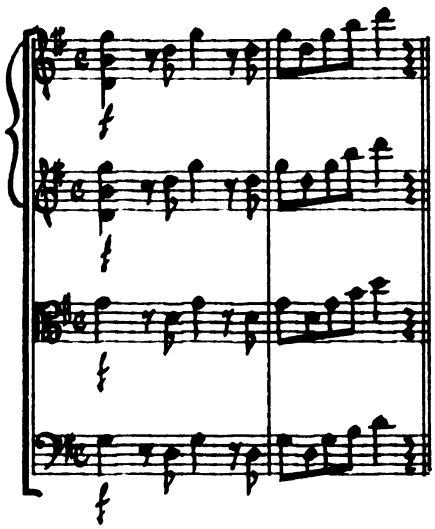
_____

(Answer on next page.)

17. Varied spacing or voicing of parts is possible when octave doubling is used. One possibility is illustrated in the following example. (Discounting the initial chord.)

(Continued on next page.)

Eine Kleine Nachtmusik Mozart



The total "spread" (interval between violins and double basses on any given note) of the above is _____ octaves.

three

18.

Look again at the example in Frame 17. Are there any gaps in this passage or is each note sounding in every octave?

Answer: _____

_____

Each note is sounding in every octave.

19.

In the example in Frame 17 are any two or more sections of the string orchestra playing in unison? _____

Which sections? _____

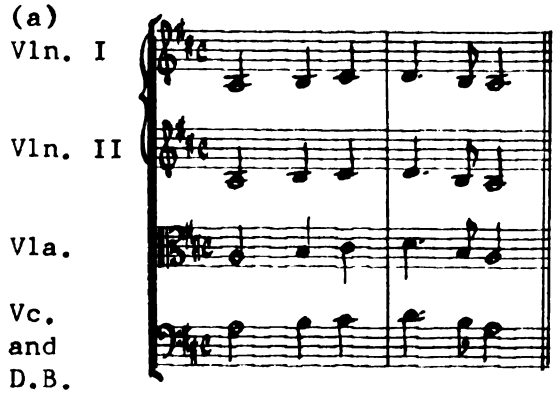
Yes.

First and second violins.

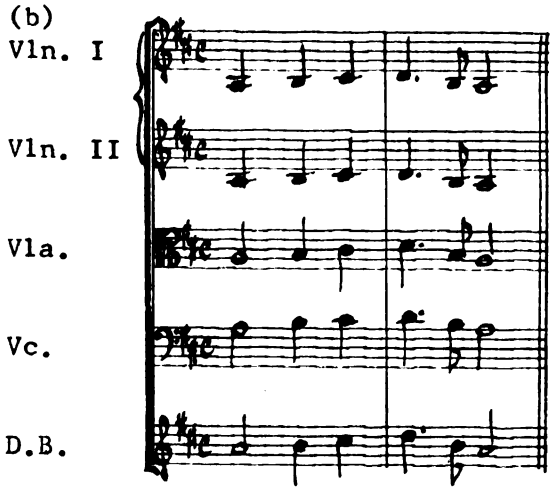
20.

Identify the example below which illustrates octave doubling.

(a)



(b)



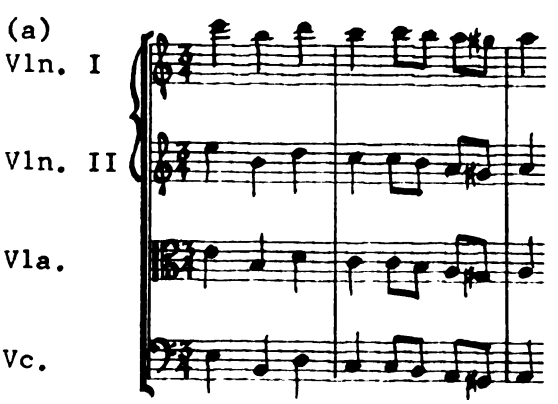
(a)

Answer: _____

21.

Proceed as in Frame 20.

(a)

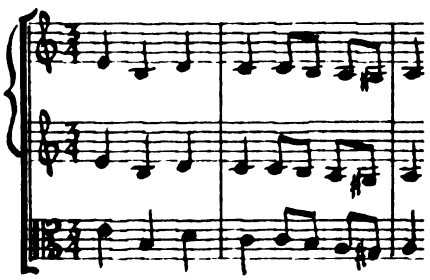


(Answer on next page.)

(Continued on next page.)

(b)

(b)
Vln. I
Vln. II
Vla.



Answer: _____

(No response necessary.)

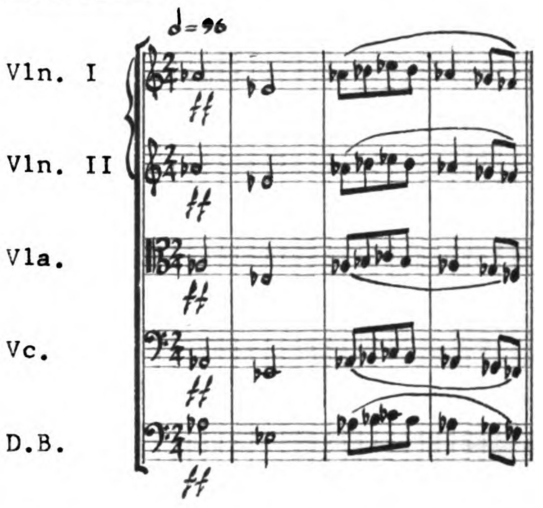
22.
As you can see in Frame 21 it is not necessary to use all the instruments of the string orchestra all the time. Indeed, the occasional ommission of one or more instruments is an important factor in achieving contrast.

(Answer on next page.)

23.
Let us return to the problem of spacing or voicing. Voicing plays a very important role in the overall aural effect of any passage. Two general types of voicing are possible when octave doubling is used. These are close and open. Close voicing means that each note is sounding in every octave between the lowest and highest voices. The following example illustrates close voicing.

(Continued on next page.)

Divertimento for String Orchestra — Bartok



Two general types of octave doubling are _____ and _____

close (and) open.

24. Define close voiced octave doubling.

_____

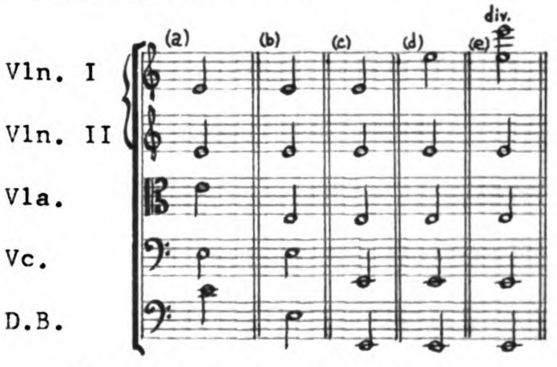
_____

_____

Each note is sounding in every octave between the lowest and highest voices.

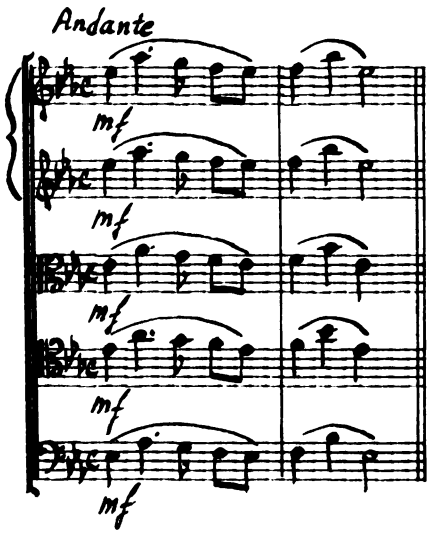
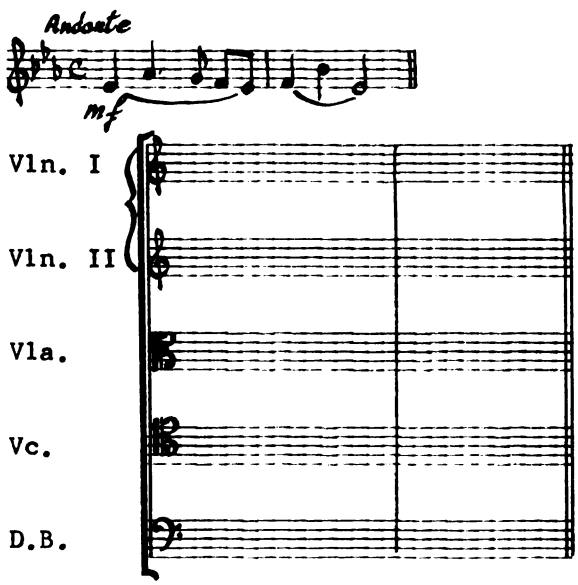
(Or equivalent.)

25. Several types of close voicing are possible depending upon the interval between the outside parts. The following example illustrates the narrowest through the widest close voicing on a given note.



(Answer on next page.)

(Continued on next page.)

a. 1 b. 2 c. 3 d. 4 e. 5	In the spaces provided below give the number of octaves between the first violin and double bass in each of the examples at the beginning of this frame. a. _____ b. _____ c. _____ d. _____ e. _____
	26. On the staves provided, score the following line in <u>close voicing</u> having a "spread" of three octaves. Double the violas with the cellos; do not write for extended double bass. 

27.

In the exercise in Frame 26 you were asked to double the violas with the cellos. The reason for this is that a part played by violas alone will probably not be heard when doubling occurs on other parts due to the mellow and subdued timbre of the viola. In cases where no other doubling is used the violas <u>can</u> carry their own part.

Under what conditions should the violas not be given a part by themselves? _____

_____

When doubling occurs on other parts.

28.

Under what conditions can the violas carry their own part? ____

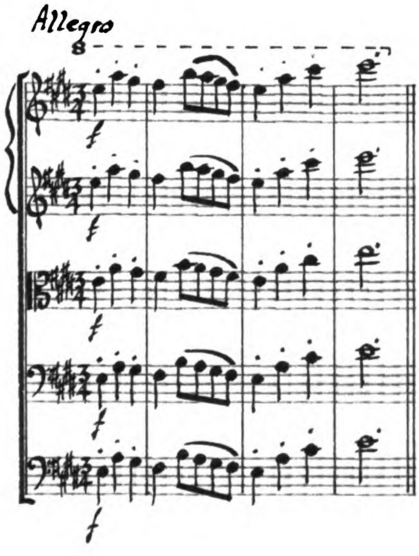
_____

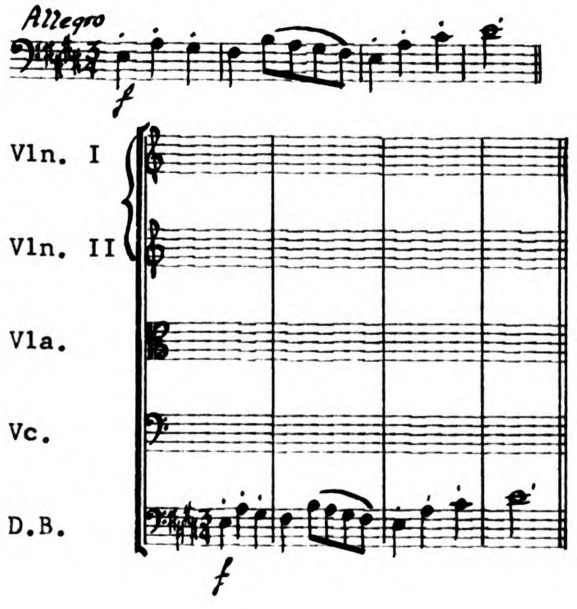
_____

When no other doublings occur.

29.

On the staves below score the following line in <u>close voicing</u> with a "spread" of 5 octaves.





30. The general effect of close voicing is solid and forceful. This texture is useful for statements of thematic material where unity is desired or will stand out in bold relief in contrast to other textures at points of punctuation or cadence.

Describe the general effect of close voicing in octave passages.

Solid and forceful.

---

31. Close voicing in octave passages is useful for statements of thematic material where _____ is desired.

unity

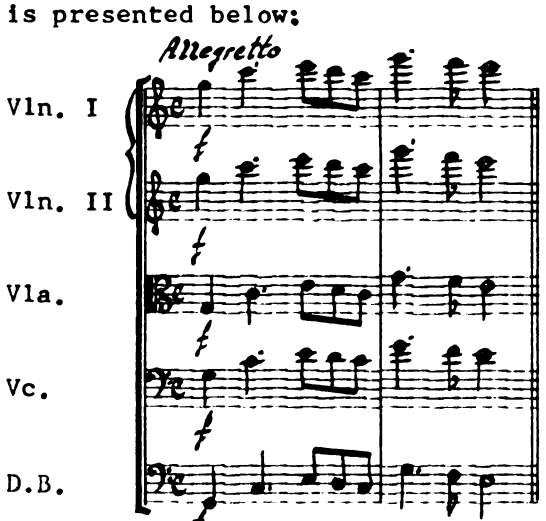
---

32. Close voicing may be used to set off points of punctuation or cadence in _____ to other textures.

contrast

---

33. It is also possible to write a passage in which each note is not sounding in every octave between the outer voices. This type of octave doubling is called open voicing. An example of open voicing is presented below:



(Answer on next page.)

(Continued on next page.)

Define open voicing. _____

A passage in which each note is not sounding in every octave between the outer voices.

(Or equivalent.)

34.

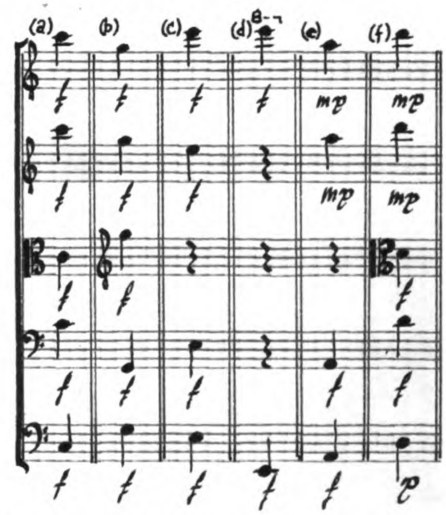
Open voicing has a "hollow" or "empty" sound. The effect might even be described as "exotic." The wider the gaps in the voicing, the more hollow it will sound.

Describe the sound of open voicing.

Hollow, empty, exotic.

35.

Several possibilities exist in open voicing including the omission of one or more instruments. Study the following examples:



There are of course more possibilities than the six illustrated above.

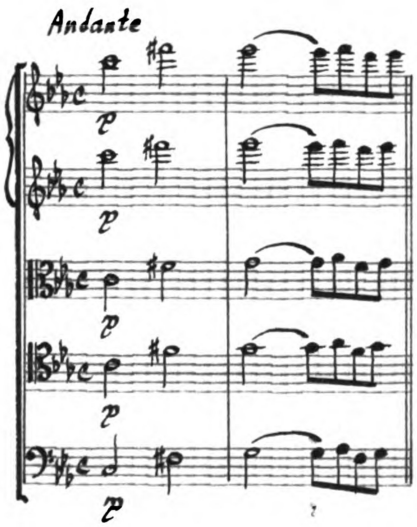
(Answer on next page.)

(Continued on next page.)

1. (d)
2. (a)
3. (f)
4. (b)
5. (c)
6. (e)

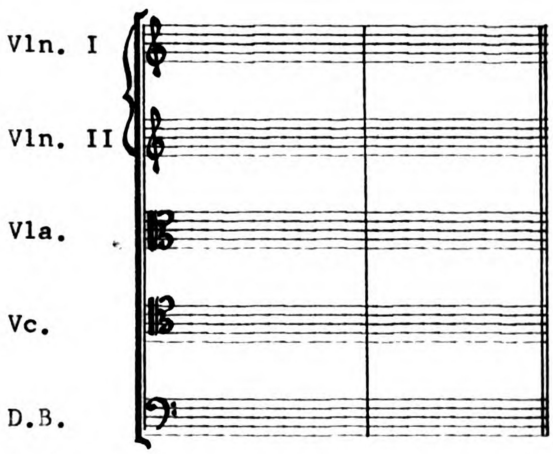
After each of the following statements identify by letter the example from the preceding group which the statement best describes. (Two instruments doubled on the same pitch equal two parts but only one voice, etc.)

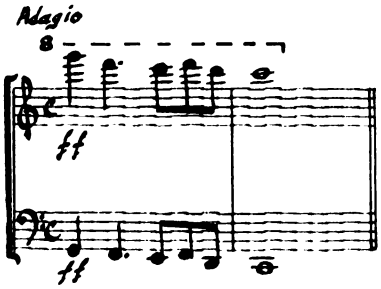
1. Most hollow sound. _____
2. Three voices equally spaced and equally emphasized. _____
3. Middle voice emphasized. _____
4. Five parts, two voices. _____
5. Four voices, widest spacing in the middle. _____
6. Lower voices emphasized. _____



36.

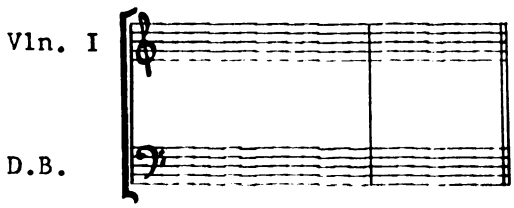
On the staves below, score the following line in equal, open spacing in three voices. Choose doubling that will give equal prominence to all three voices. Do not write for extended double bass.

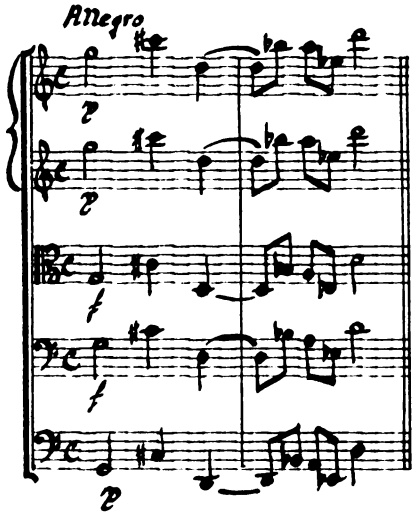




37.

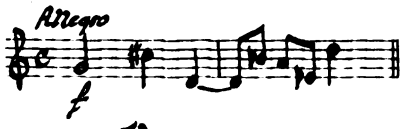
Using first violins and double basses with extensions, score the following line on the staves provided, in <u>open voicing</u> with the most hollow sound possible.

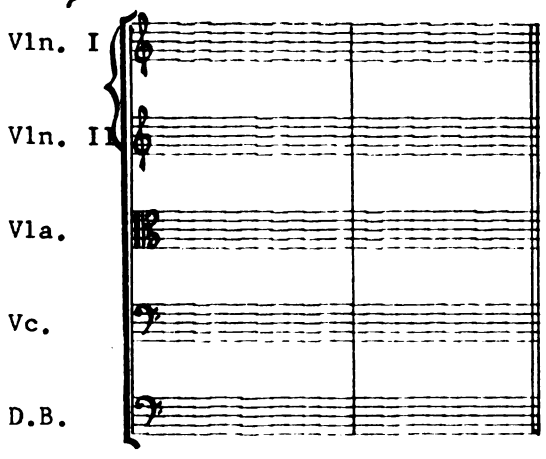




38.

On the staves provided for your answer, score the following line for three evenly-spaced, open voices. Emphasize the middle voice by doubling and dynamics. Write for extended double bass.



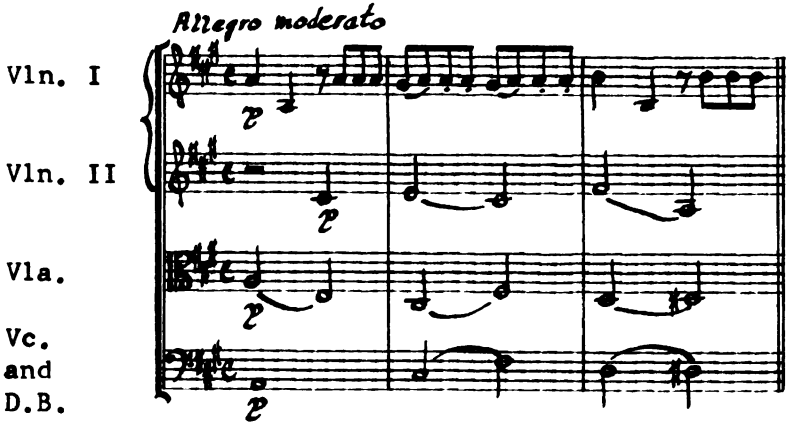


(No response necessary.)	39. Because of its unique sound open voicing is more in the category of orchestral effects than a standard texture. It is used considerably less than the close voicing.
unison (and) octave doubling (Any order.)	40. So far we have discussed only the monophonic texture. The two general types of monophonic texture are the _____ and _____
open (and) close (Any order.)	41. There are two specific types of octave doubling. They are _____ and _____
(Answer on next page.)	42. The second basic musical texture in terms of complexity is the homophonic texture. Homophonic texture may be defined as one principal melodic voice supported harmonically and rhythmically by other subordinate voices. The following example illustrates homophonic texture. (Continued on next page.)

One principal melodic voice supported harmonically and rhythmically by other subordinate voices.

(Your own words.)

Symphony in A, K. 201 — Mozart



Define homophonic texture in your own words.

(Answer on next page.)

43.

In the example in Frame 42 the first violins obviously have the principal melodic voice. The other instruments supply the harmonic background and establish a broad feeling of the meter of the piece against which the first violins play the rhythmically more interesting melody.

(Continued on next page.)

Describe briefly the rhythmic relationship between the melody and the supporting voices in the example in Frame 42. _____

_____

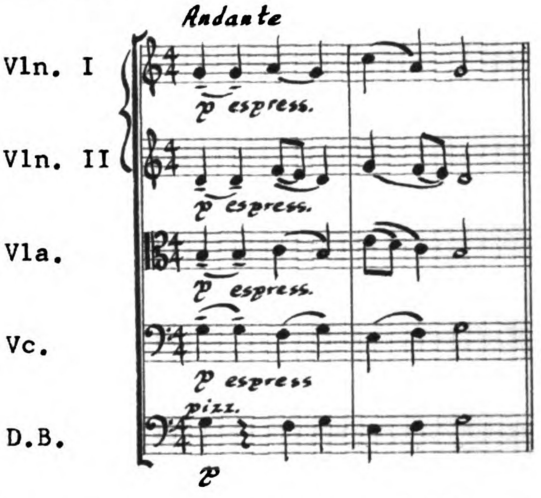
Contrasting or different.

(Or equivalent.)

44.

Another homophonic texture is illustrated by the following example:

Psalm and Fugue for String Orchestra — Hovaness



In the example above the rhythm of all parts is essentially the same. This type of homophonic texture is known to students of harmony as _ _ _ _ _ _ _ style.

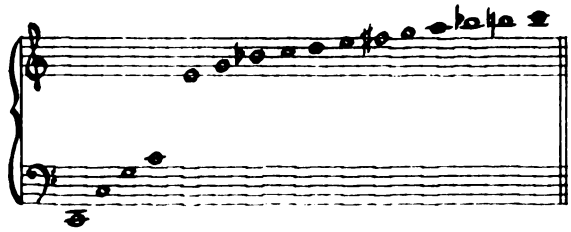
chorale

45.

Obviously the use of a homophonic texture will necessitate working with chords. Therefore some understanding of chord voicing is a logical prerequisite to a study of this texture. The overtone series illustrated below furnishes a practical guide to voicing chords with the greatest degree of clarity.

(Answer on next page.)

(Continued on next page.)



The largest intervals between adjacent tones of the overtone series occur at the (top/bottom) _____

bottom

---

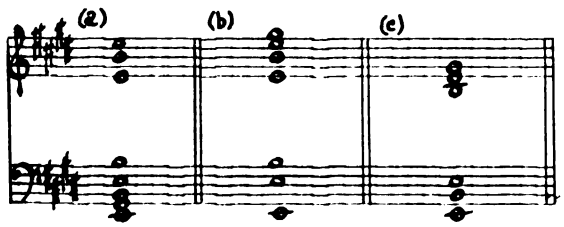
46. Conversly the smallest intervals between adjacent tones occur at the _____ of the overtone series.

top

---

47. Chord voicings similar to the voicing or spacing of the overtone series (larger intervals at the bottom, smaller intervals at the top) will result in greater clarity.

Identify by letter the chord voicing below which would result in the greatest clarity.



(b)

Answer: _____

---

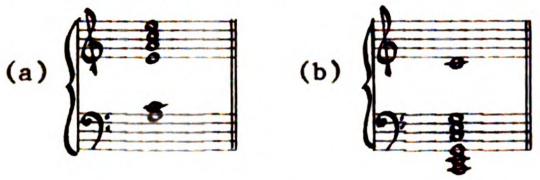
48. Identify the chord voicing in the preceeding frame which would result in the least clarity.

(a)

Answer: _____

49.

Chord voicing is affected to some degree by tessitura. Example (a) below is entirely satisfactory as far as clarity is concerned. Example (b) is not.



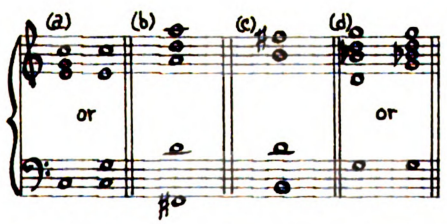
The following practical guideline for chord voicing is offered. The lower (in pitch) the lowest voice is, the more open the spacing of the lower voices of the chord.

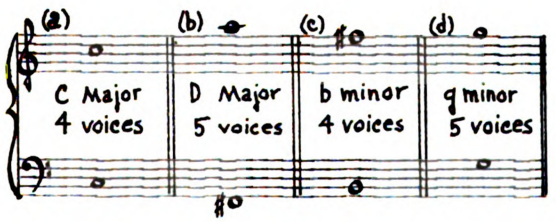
Another principle to remember is that in chords of six voices or less, one third sounding is enough. Let the other voices sound the root or fifth.

(No response necessary.)

50.

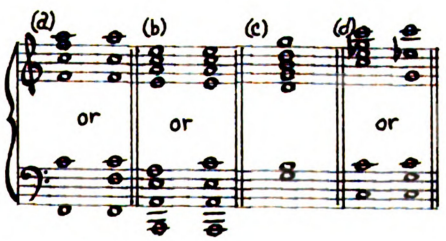
Add the necessary voices to the chords requested below. The total number of voices and the two outside voices are given. Emphasize clarity in your voicing.

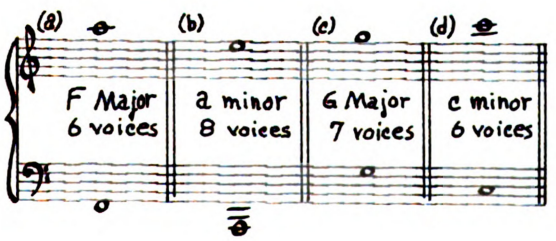




51.

Proceed as above.





open

52. The lower a chord is pitched, the more _____ the spacing of the lower voices of the chord.

---

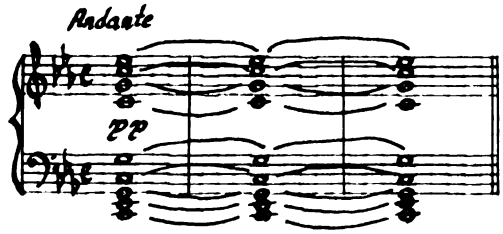
one

53. In chords of six voices or less _____ third is enough.

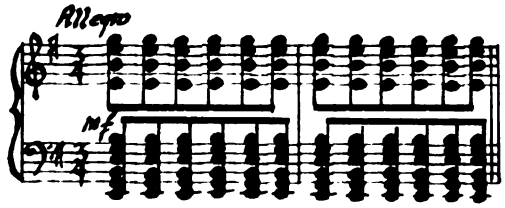
---

54. It is possible, of course, to use irregular spacing for effect. The thick, heavy sound of close voicing in the low register may be used as a special sustained effect as in the following examples.

(a)

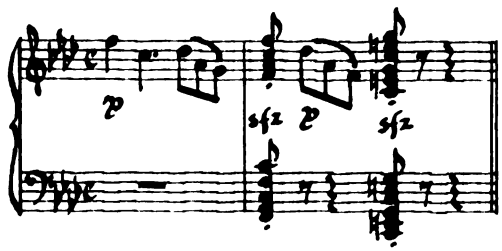


(b)



Close voicing in the low register can also heighten the purely percussive effect of staccato chords as in the example below:

(c)



Describe briefly the sound of chords scored with close voicing in the low register. _____

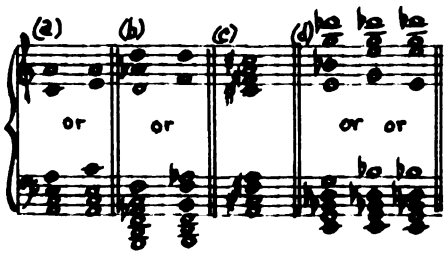
Thick or heavy.

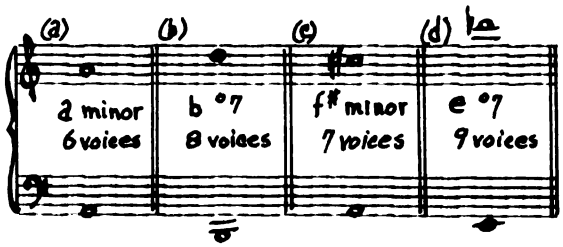
(Or equivalent.)

percussive

55. In addition to a thick, sustained sound, completely close-voiced chords can also be used for a _____ effect.

56. Complete the chords requested below using close voicing in the lower register. The outside voices and the total number of voices are given. Do not leave more than an octave between any two adjacent voices.





57. The irregular voicing displayed above could properly be considered a special effect, as clarity is the norm in all scoring. Additional voices beyond the five parts of the standard string orchestra can be obtained through the use of multiple stops or divisi.

What type of chord voicing may be considered a special effect?

Close voicing in the low register.

58. What two devices may be used to obtain the "extra" voices needed for a seven-or eight-voiced chord?

Multiple stops and divisi

(Answer on next page.)

59.

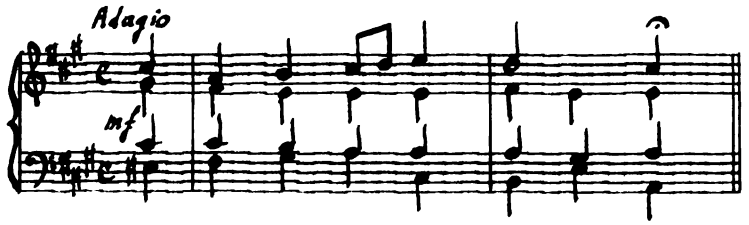
The simplest type of homophonic texture, rhythmically speaking, is the chorale. The transcribing of chorales is a useful vehicle for studying other aspects of scoring for string orchestra.

In transcribing a chorale for string orchestra, the most obvious distribution of parts is to give the violins the soprano line, second violins the alto, violas the tenor, and cellos and basses the bass voice (resulting in octave doubling of that voice.)

Transcribe the following chorale phrase in the manner described above on the blank score provided.

O Welt, Ich Muss Dich Lassen

Bach



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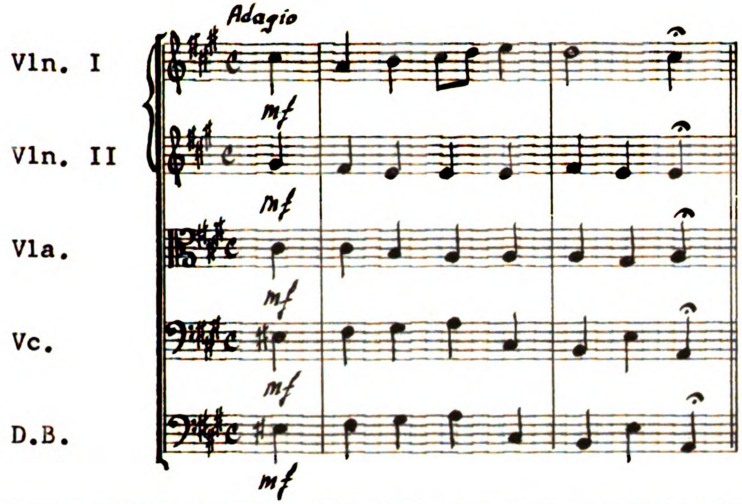
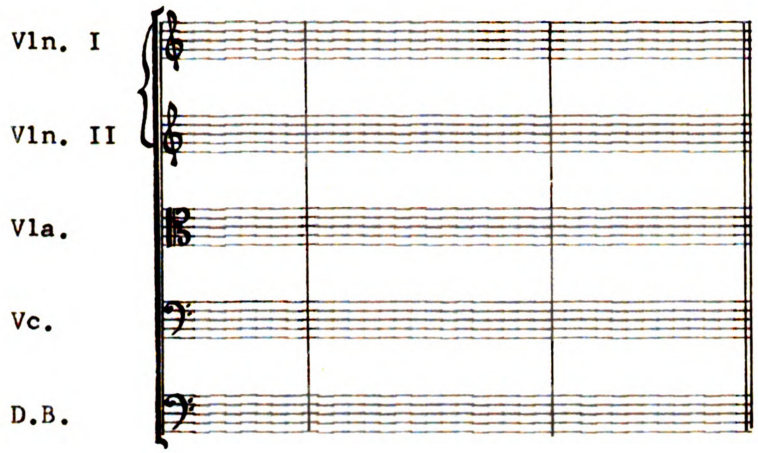


(Answer on next page.)

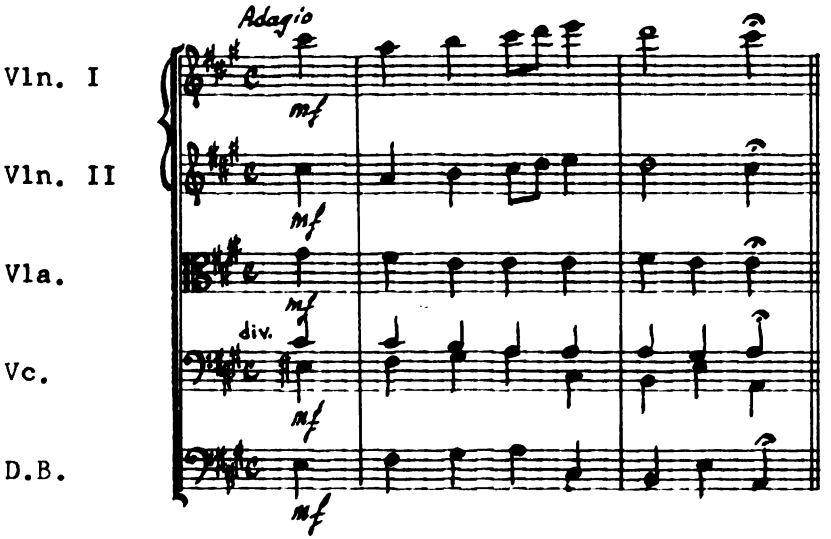


60.
The scoring illustrated above will produce a good solid sound with a string bass line. It is, however, rather plain and "un-orchestral." A more brilliant setting of this phrase is illustrated in the following example.

(Continued on next page.)

one octave

O Welt, Ich Muss Dich Lassen — Bach



In the scoring above, the first violins are playing the melody _____ above the original.
(interval)

(a) melody or soprano

(b) alto

(c) tenor (and) bass

(d) bass

61. List the voice parts of the chorale played by the other instruments.

(a) second violins _____

(b) violas _____

(c) cellos _____ and _____

(d) double basses _____

---

brilliant

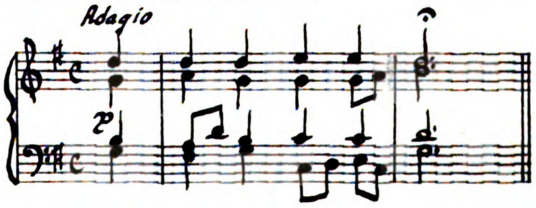
62. The doubling of melody one octave higher in Frame 60 produces a more _____ sound than the original version.

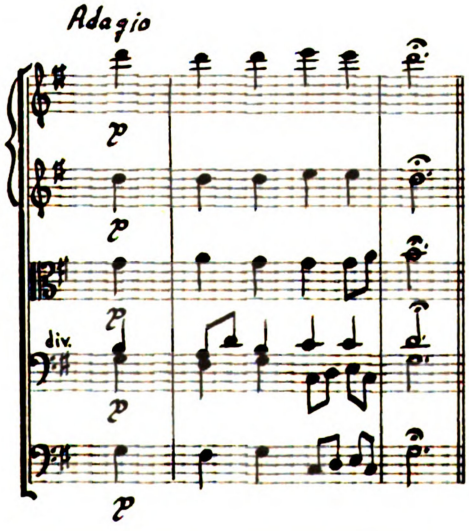
---

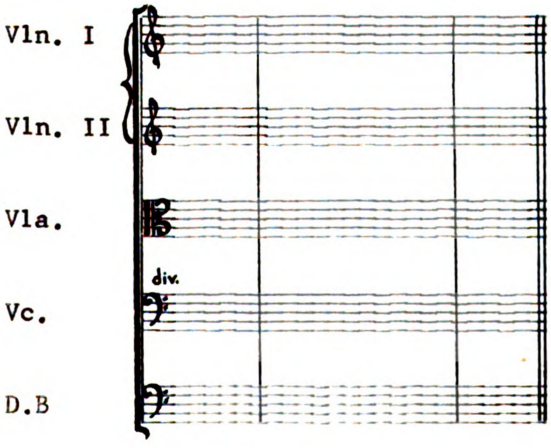
63. Naturally this doubling of the melody will emphasize the melody.

Score the following phrase on the staves provided. Emphasize the melody by octave doubling as in Frame 60.

Nun Danket Alle Gott — Bach







64.
Name the two factors achieved by the type of scoring exemplified in Frame 63.

a. More brilliant sound

a. _____

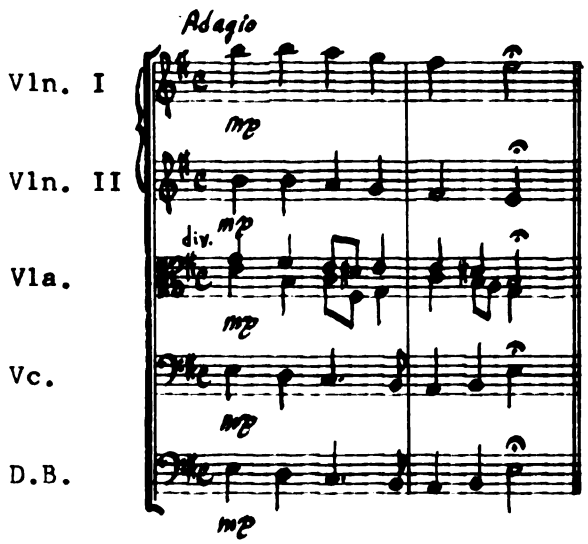
b. Melody emphasized.

b. _____

65.
The curious student will probably ask why the cellos were divided in Frames 60 and 62 rather than the violas. The reason is this: the viola has the least carrying power of all the stringed instruments. In school orchestras especially, the violas tend to be the weakest section. Therefore, dividing the violas on the alto and tenor while the soprano and bass are doubled in octaves would greatly weaken those parts. The cellos are at their best in the tenor range and half of the section can carry that part without difficulty.

Which scoring below will produce a more <u>evenly</u> <u>balanced</u> sound?

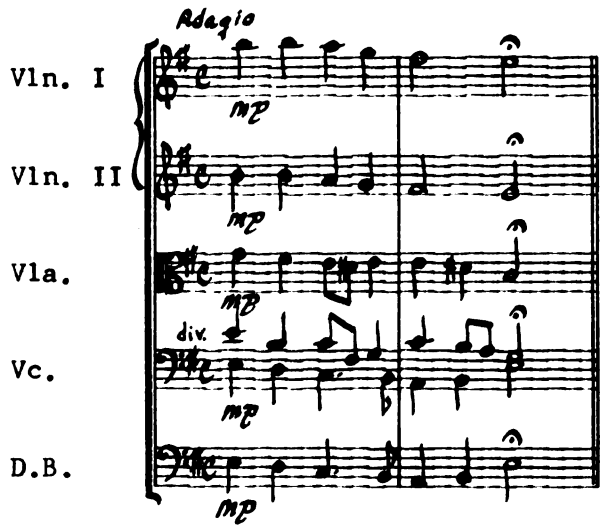
(a) Jesu, Meine Freude Bach



(Answer on next page.)

(Continued on next page.)

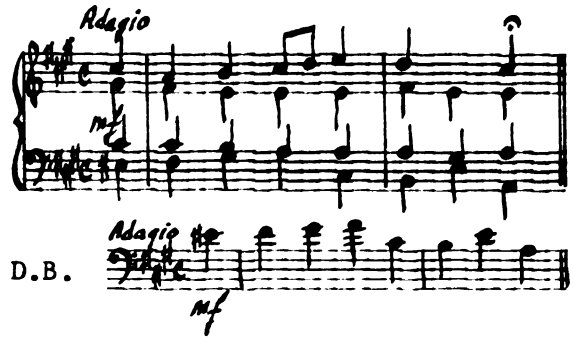
(b) Jesu, Meine Freude Bach



(b) Answer: _____

66. Another question which the curious student may ask is why not give the bass voice to the double basses alone, thereby avoiding the division of any section of the string orchestra. This may be done if the bass voice is low enough to be played at its original pitch as follows:

O Welt, Ich Muss Dich Lassen Bach



But high bass parts are not appropriate for school orchestras.

(Answer on next page.)

(Continued on next page.)

The double basses alone playing the bass voice an octave lower than the original will sound heavy and muddy without the added clarity of the cellos an octave above the basses. Also, there will be too large an interval between the bass and tenor voices.

Is the following double bass part suitable for school orchestras?

D.B. 

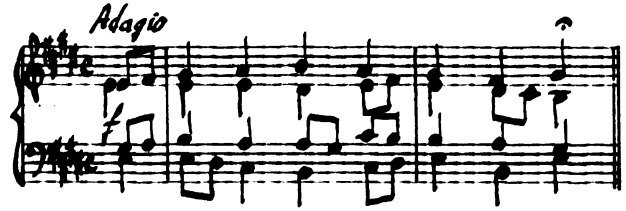
No.

Answer: _____

67.

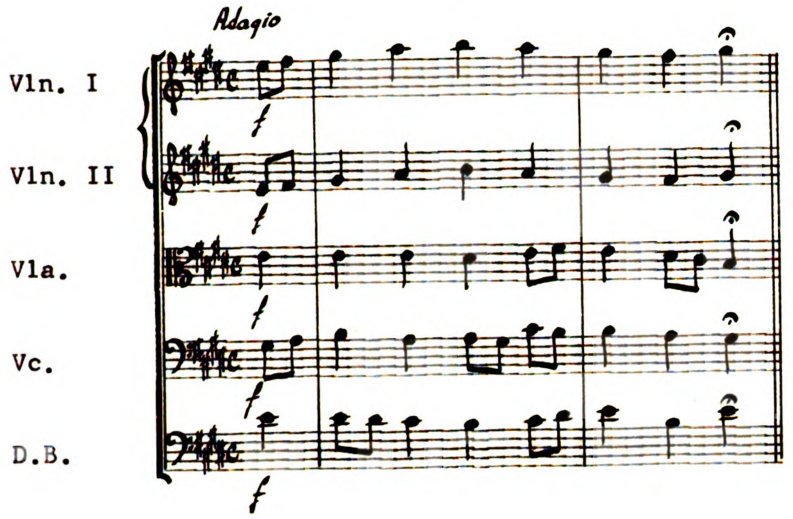
Score the following phrase with the soprano doubled at the octave in the violins and the double basses alone on the bass voice. Use the blank score provided for your answer.

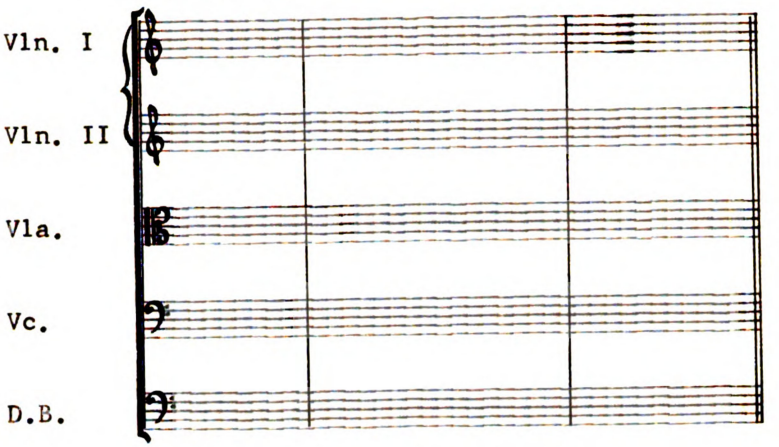
Allein Gott In Der Höh — Mendelssohn



(Answer on next page.)

(Continued on next page.)

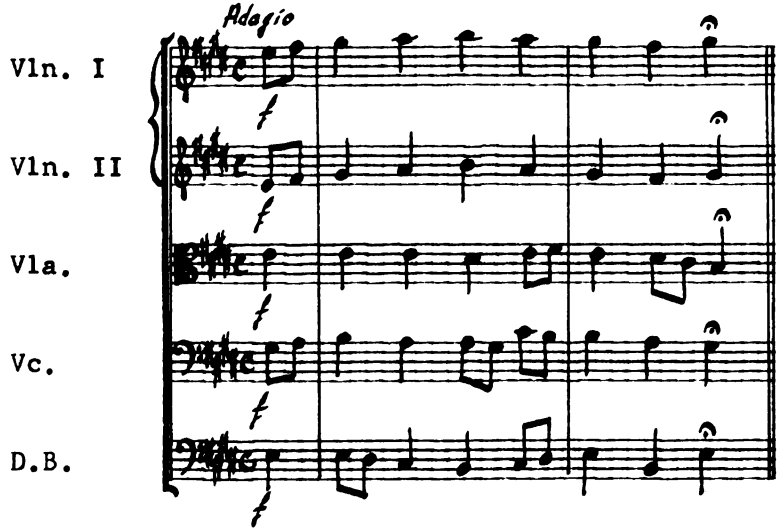

Adagio
Vln. I
Vln. II
Vla.
Vc.
D.B.
f


Vln. I
Vln. II
Vla.
Vc.
D.B.

68.

Describe briefly the effect of the bass voice in the following score.

Allein Gott In Der Höh — Mendelssohn



Answer: _____

Heavy and muddy.

(Or equivalent.)

69.

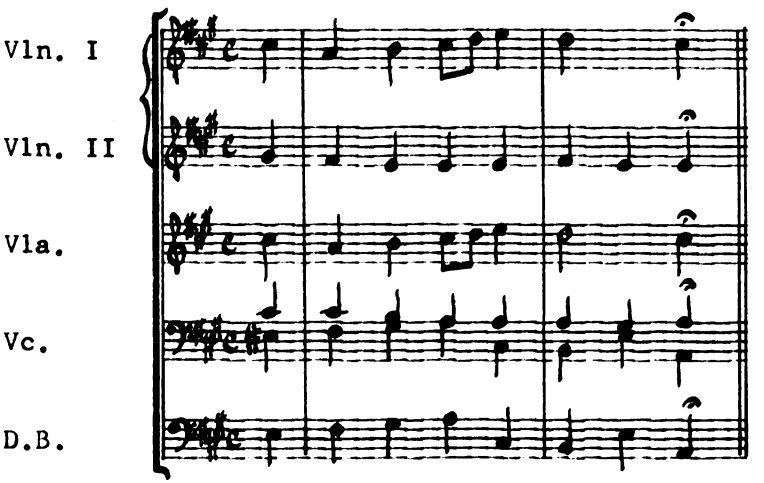
In chorale style the bass voice will have greater clarity if played in octaves by the double basses and at least part of the cellos. This does not mean that the basses can never play without the cellos.

(No response necessary.)

70.

Added warmth may be given the melody by doubling the violas with the first violins at the unison. In this case the alto is usually in the second violins and the cellos divided between the tenor and bass lines. Study the following example.

O Welt, Ich Muss Dich Lassen — Bach



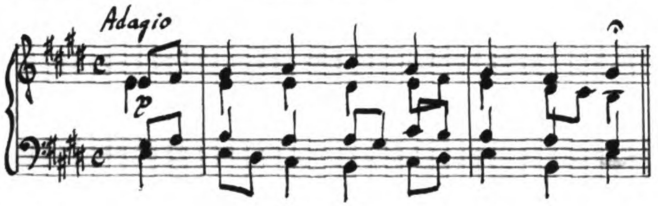
Doubling the viola with the first violins in the above example adds _____ to the melody.

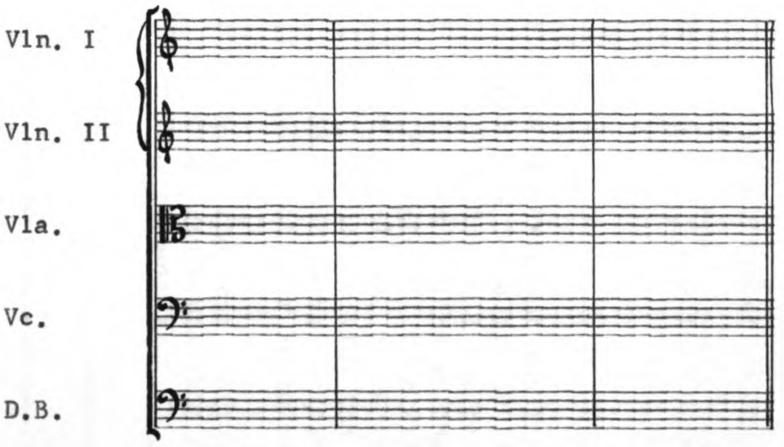
warmth

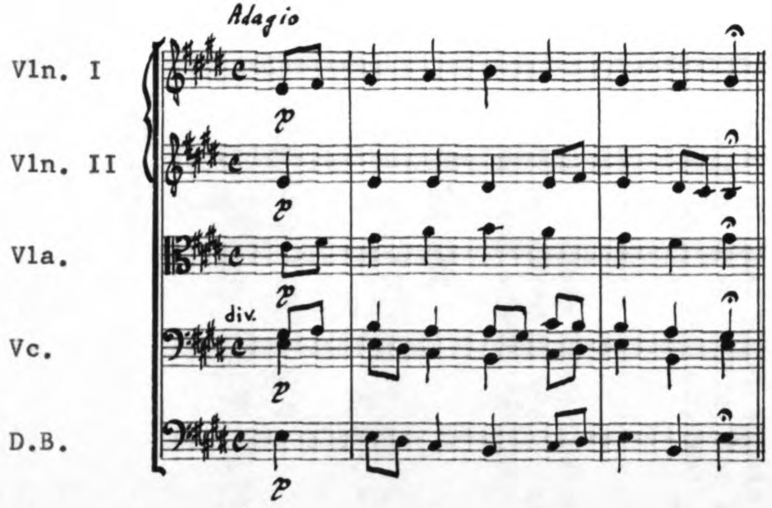
71.

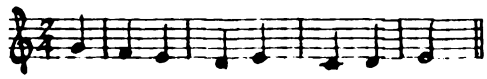
On the staves provided, score the following phrase so as to provide a richer, warmer soprano line.

Allein Gott In Das Höh — Mendelssohn



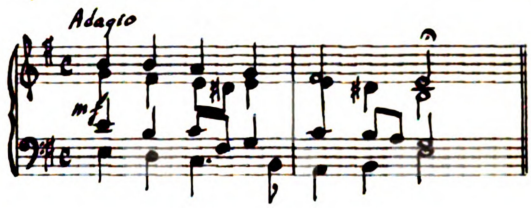


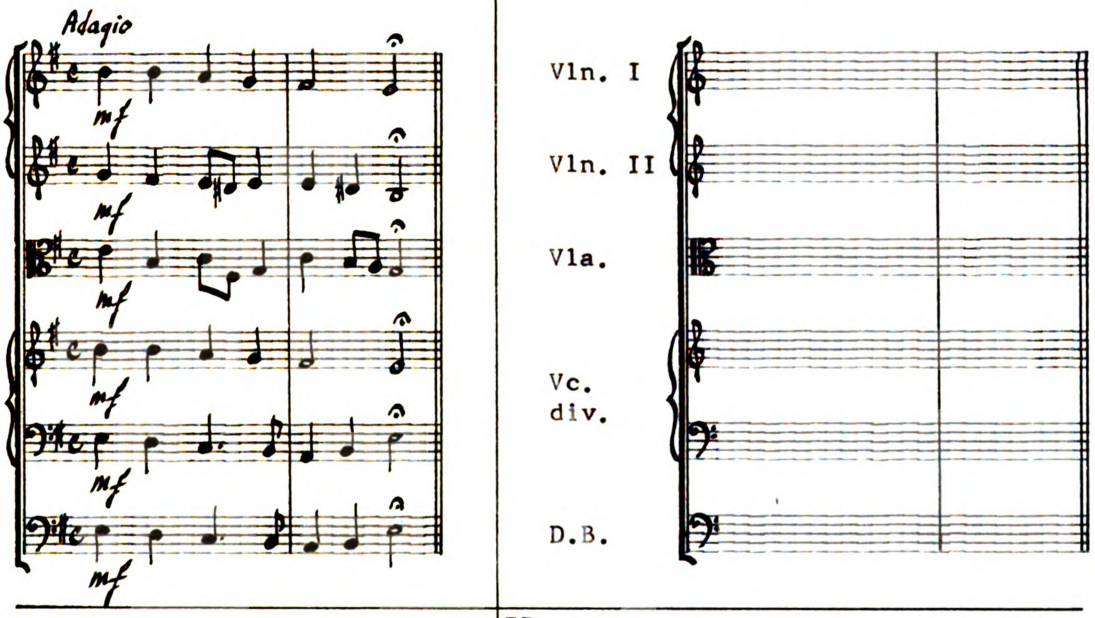


violas (and) first violins	72. A richer, warmer melody will result when _____ and _____ _____ are doubled at the unison.
By doubling half of the cellos with the first violins at the unison on the melody.	73. The most vibrant and intense sound possible for a melody is obtained by doubling half the cellos with the first violins at the unison on the melody. This will often, but not always, place the upper part of the cello divisi too high for school orchestra cellists but is appropriate for advanced players. How can the most vibrant and intense sound possible for a melody be obtained? _____
False.	74. Placing cellos on the melody at its original pitch should never be done when scoring for school orchestra. (True/False) _____
(b)	75. Which chorale melody below should not be scored at the original pitch for school cellists. O Fader Var — Sweeden (a)  Nun Danket Alle Gott — Crüger (b)  Answer: _____

76. Score the following chorale phrase with half doubling the first violins on the melody. (Notice the two staves for the cellos due to the different clefs required.)

Jesu, Meine Freude — Bach





Vibrant and intense.

(Or equivalent.)

77. Describe briefly the sound of cellos and violins doubled at the unison. _____

Violas and violins.

78. What doubling may be used to provide a richer, warmer melody than violins alone but not as intense as cellos doubled with violins?

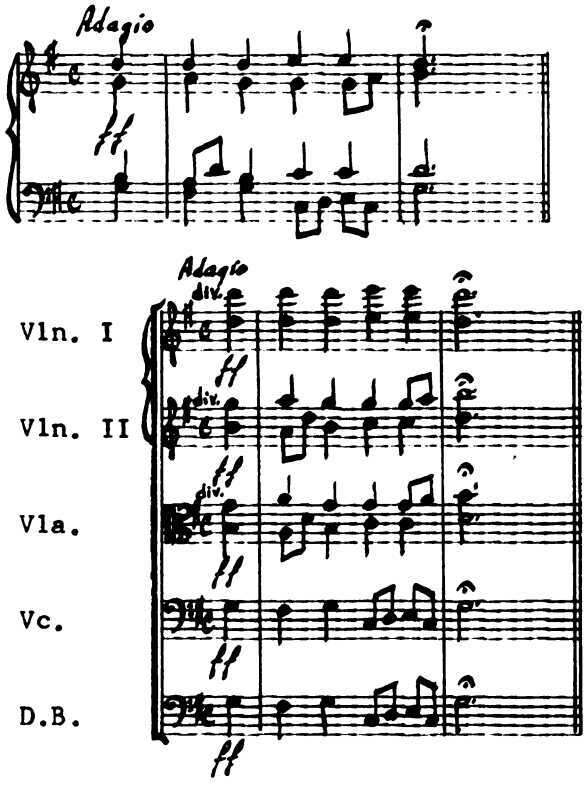
Answer: _____

79.

So far we have studied octave doubling of only the bass and soprano voices. In cases where the soprano is doubled an octave higher the alto and tenor may also be doubled at the octave above to provide a full, massive texture.

Analyze the scoring of the following example.

Nun Danket Alle Gott — Bach



Complete the following statements about the score above.

(a) The first violins have the _____ voice doubled at the _____ above.
(interval)

(a) soprano octave

(b) The second violins have the _____ and _____ voices one _____
(interval)
above the original pitch.

(b) alto (and) tenor octave

(Answer on next page.)

(Continued on next page.)

(c) alto (and) tenor

(d) bass

(c) The violas have the _____ and _____

(d) The cellos and basses have the _____ voice in octaves.

---

eight

80. The total number of parts (not voices) in the example in Frame 79 is _____.

Full and massive.

(Or equivalent.)

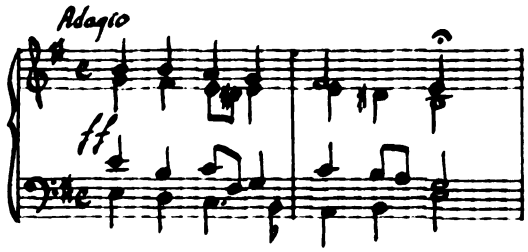
81. Describe briefly the orchestral effect produced when all voices are doubled in octaves as in Frame 79.

_____

---

82. On the blank score provided, write an eight-part setting of the following chorale phrase.

Jesu, Meine Freude Bach



(Answer on next page.)

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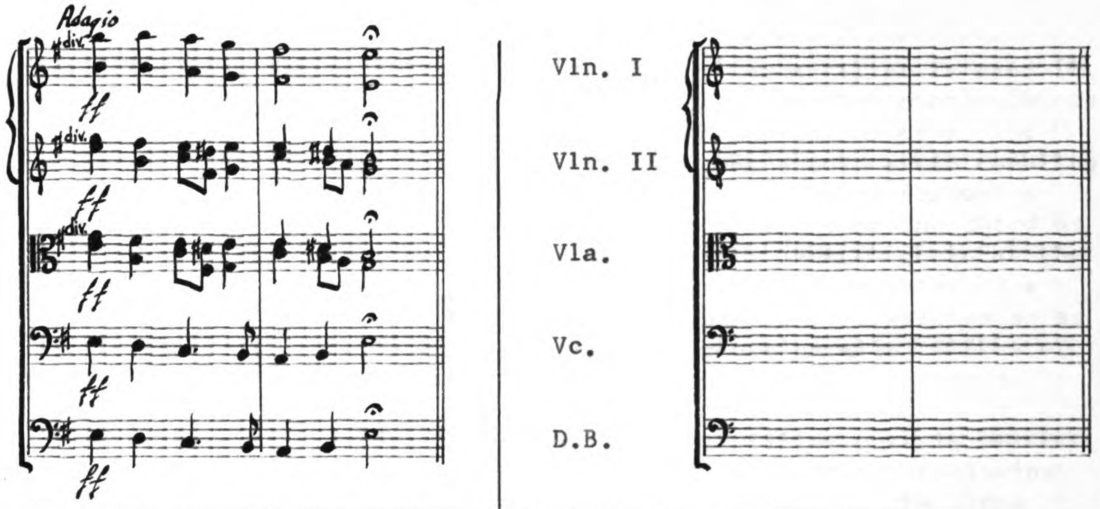


No.

83. Does a full eight-part setting seem appropriate for a soft dynamic level? _____.

To fill in undesirable wide gaps between adjacent voices.

(Or equivalent.)

84. There are occasions when wide spacing between adjacent voices is undesirable in an orchestral setting. This most often occurs between the bass and tenor voices. In such instances a filler part may be added to fill in these gaps. The filler in a chorale setting is a fifth voice which may be either completely independent or alternate between doubling existing voices on chords where no filler is needed, and filling gaps in occasional wide-spaced chords.

What is the function of a filler in a chorale setting? _____

_____

False.

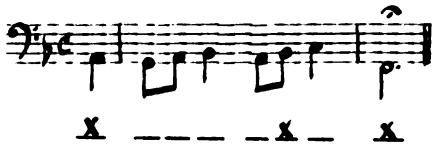
85. A filler is always a completely independent fifth voice. (True/False) _____

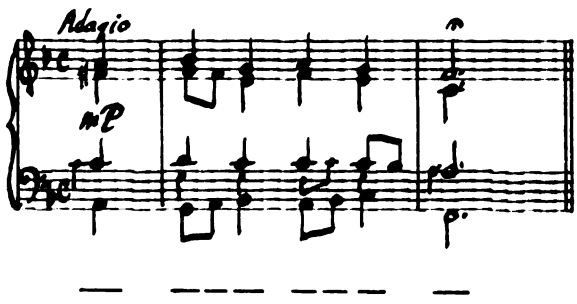
86.

No matter how a filler is used it will double existing chord members either at the unison or at the octave. One should avoid doubling the third of a triad (except a diminished triad) or the third or seventh of a seventh chord at the octave whenever possible. The filler must also be written so as not to create parallel fifths or octaves with existing voices.

A possible filler part is written in small notes in the following chorale phrase. On the lines beneath the bass part place an "X" at each point where the filler is not an added voice.

Herr Christ, Der Ein'ge Sohn Bach





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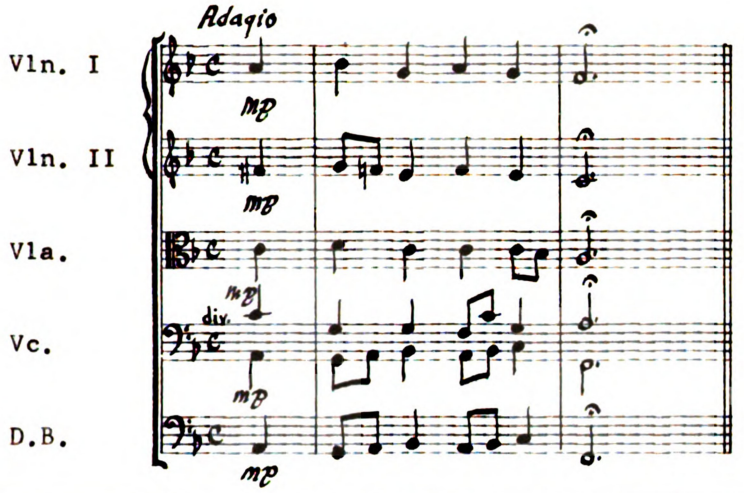
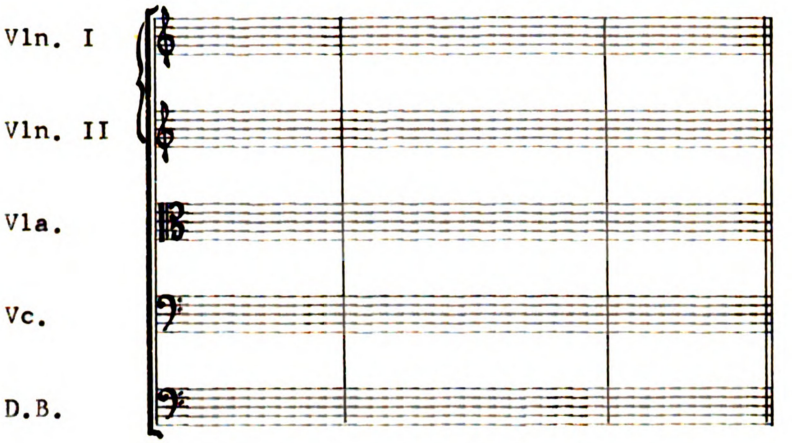


third

third (or) seventh

87.

Score the example in Frame 86 on the staves below. Put half the cellos on the filler. Do not add any other octave doublings.

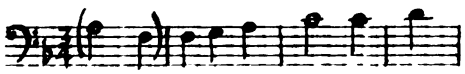


88.

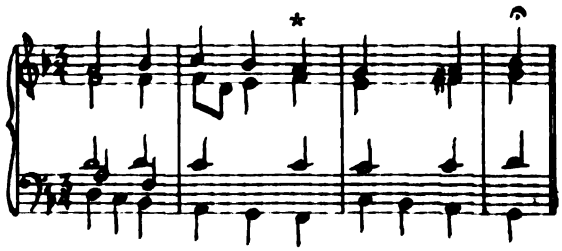
When adding a filler one should avoid the octave doubling of the _____ of a triad or the _____ or _____ of a seventh chord whenever possible with the exception of diminished triads.

root

89. In harmony you learned that it is best to double the third rather than the _____ of a diminished triad.



90. Complete a filler part for the chorale phrase below. Double the third of the chord at the asterisk to make a smoother part.



(No response necessary.)

91. While chorale style is not the most prevalent type of homophonic texture found in orchestral music, the scoring possibilities and voicing principles of chorale style apply to other homophonic textures as well.

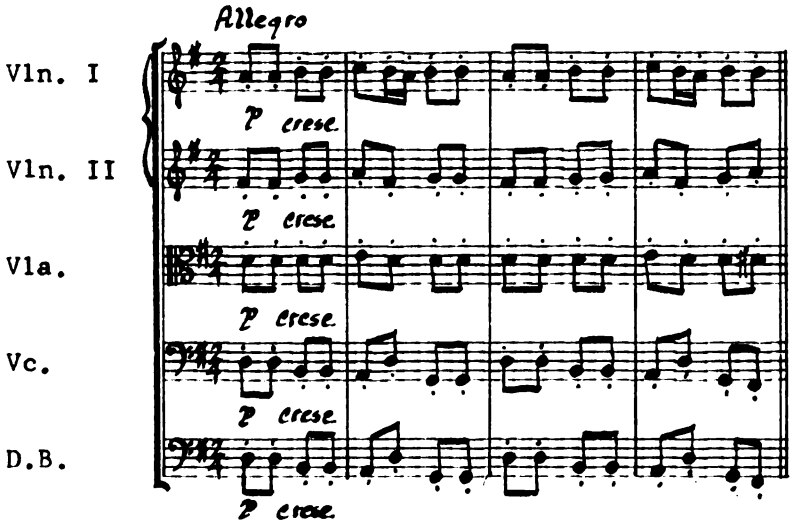
(Answer on next page.)

92. The term chorale style denotes a specific musical character as well as a texture. The chordal texture of the chorale is often used in compositions of quite a different character than the chorale.

Study the example below. Notice that, like the chorale, all voices are in basically the same rhythm.

(Continued on next page.)

Ukrarinian Suite — Porter

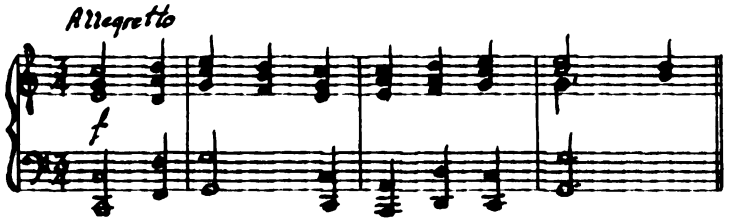


Does the above example differ essentially from chorale style except for tempo? _____

No.

93.

Score the following example for string orchestra on the staves provided.



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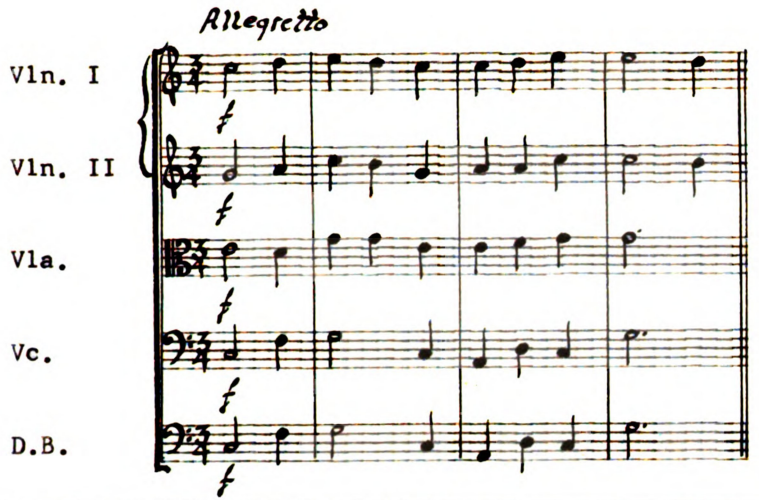
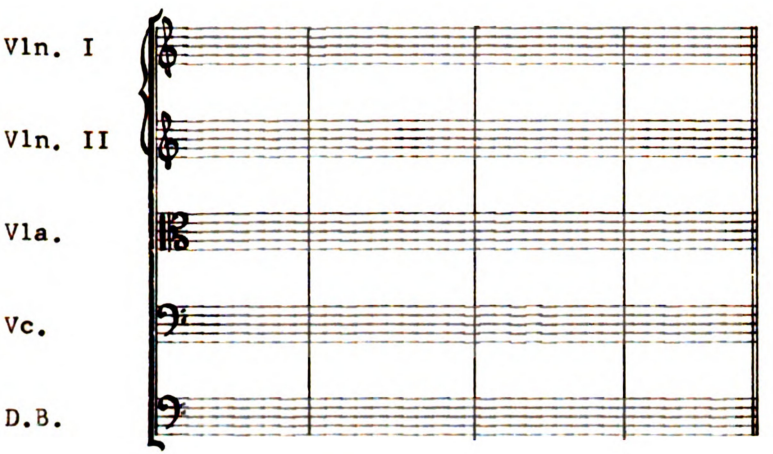
(Answer on next page.)



(Answer on next page.)

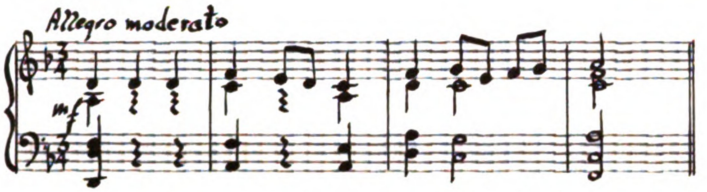


94.

A more frequently used homophonic texture is the melody with contrasting accompaniment. In this style the subordinate voices will usually have a different rhythm than the melody. The texture may vary from very simple to very complex.

The following example illustrates a rather simple melody with accompaniment.

Capriol Suite — Warlock



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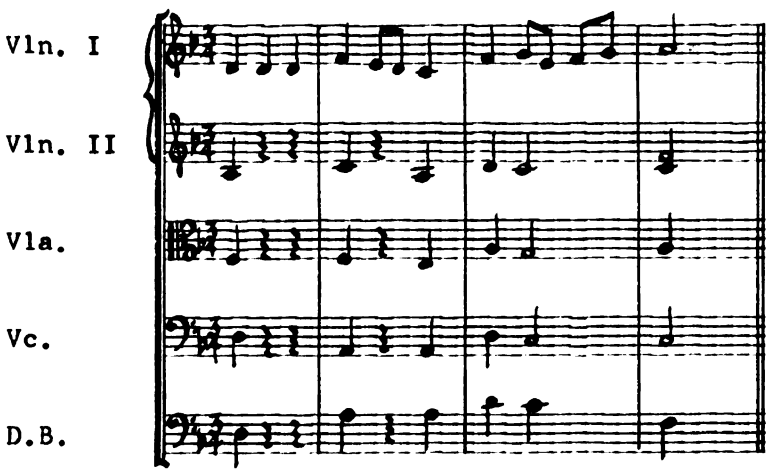
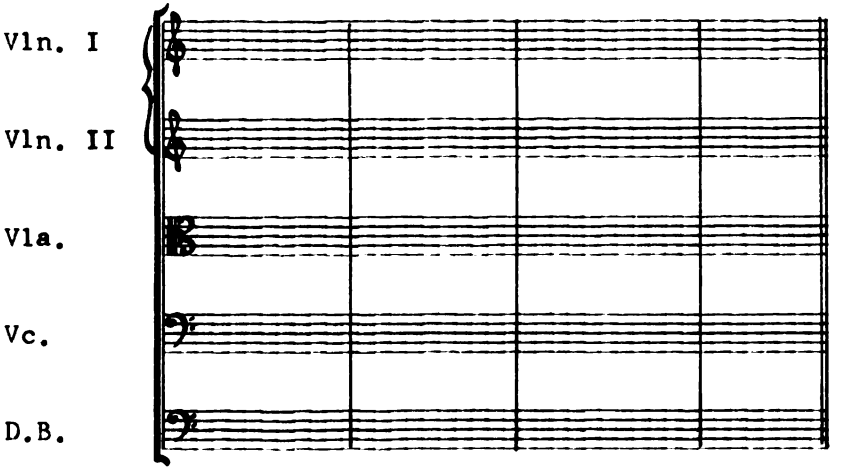


Score the preceding example on the staves below. Use no octave doublings.

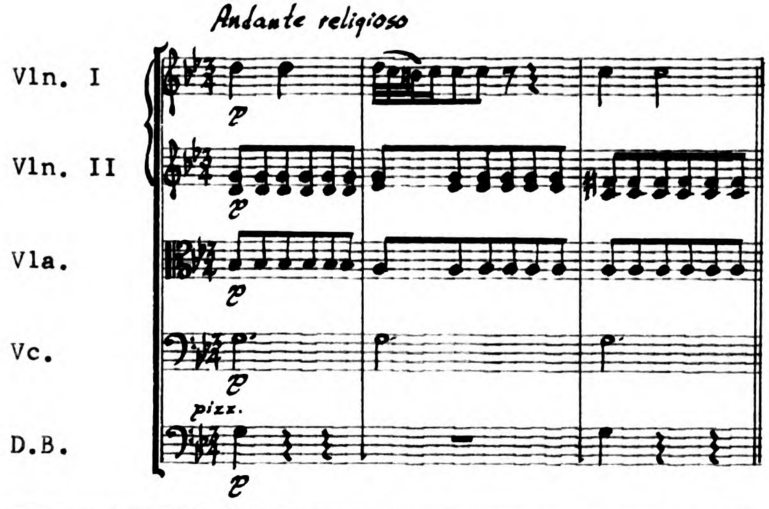


(Answer on next page.)

95.

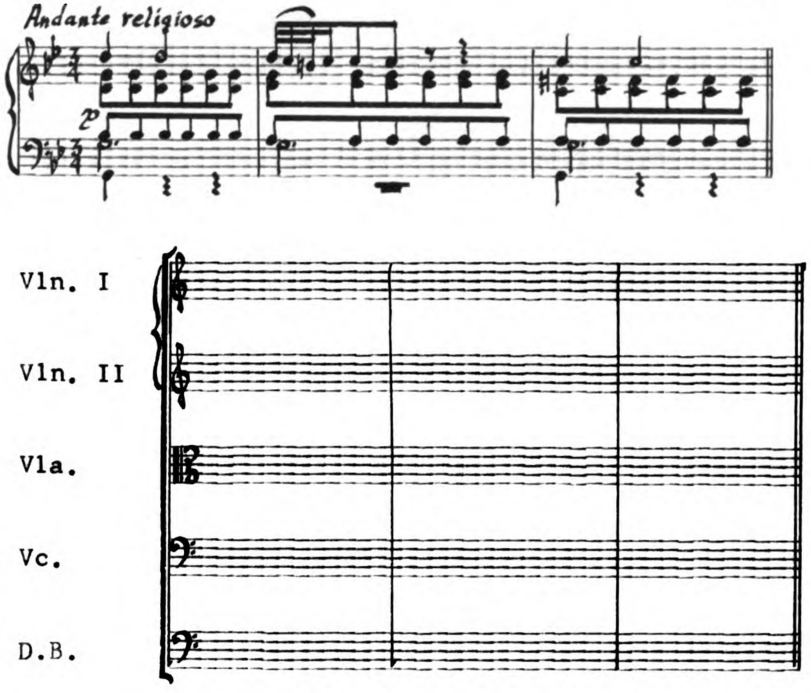
Repeated notes can be used to provide a sustained effect in the accompaniment. Score the following excerpt using divisi in the second violins. Let the basses play only when needed and mark their part pizzicato.

(Continued on next page.)



(Answer on next page.)

Suite for Strings — Grieg



96.
It is not always necessary, of course, to have the melody in the first violins. A rather unique sound can be produced by a viola melody supported by other instruments.

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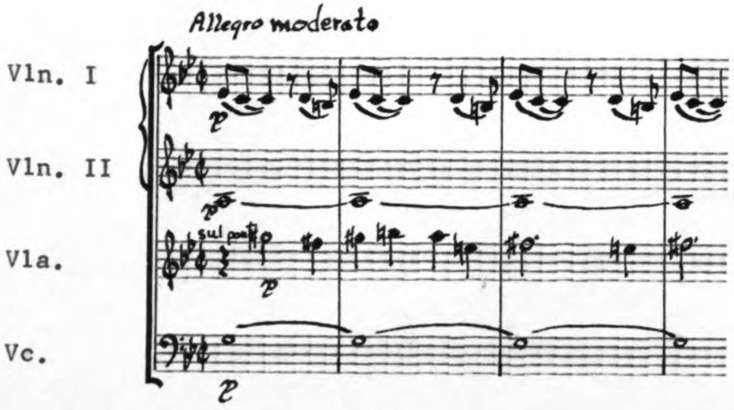
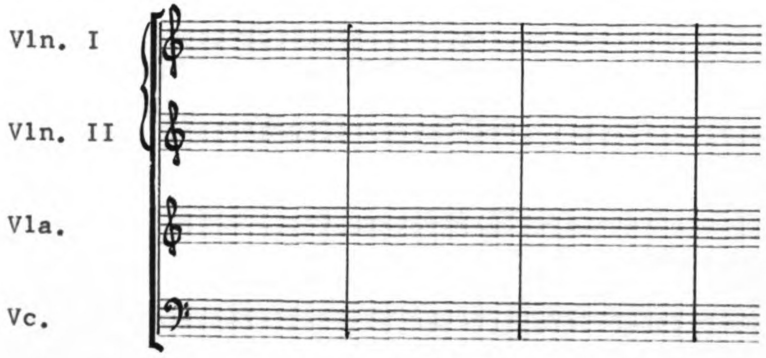


Score the following excerpt with the melody in the violas. Mark the viola part so that a thin, "glassy" sound will be produced. Omit the double basses.

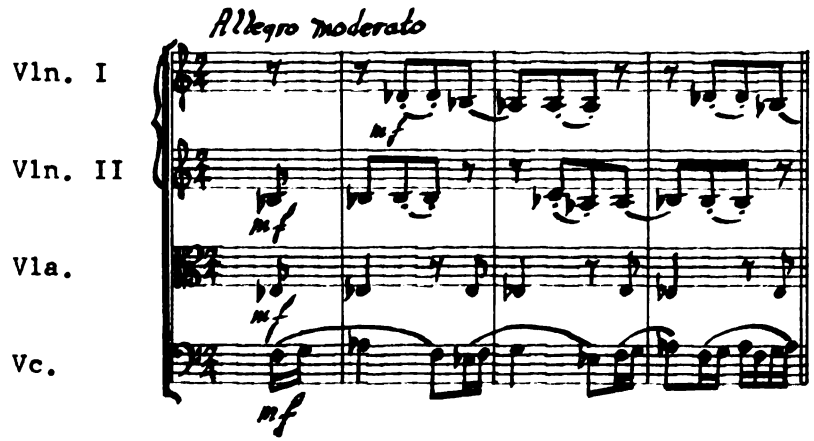
Two Pieces for String Orchestra — Copland



97.

The cello is also capable of a rich sounding melody as in the following example. Notice that the accompaniment is more complex rhythmically in this example.

Music for Strings — Porter



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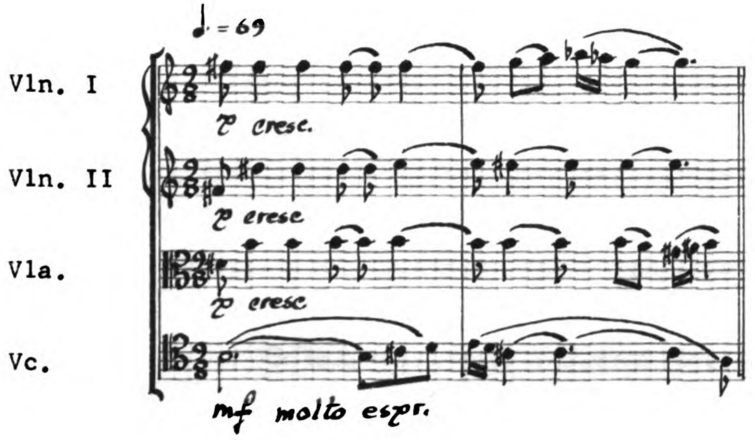
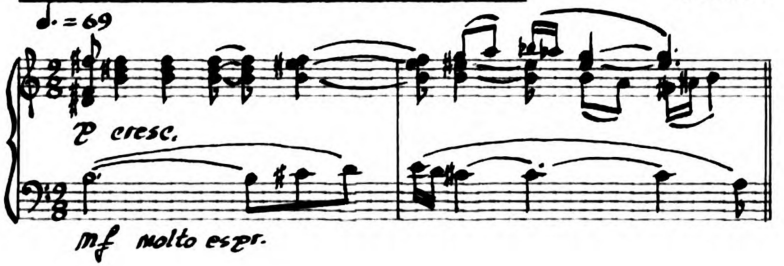
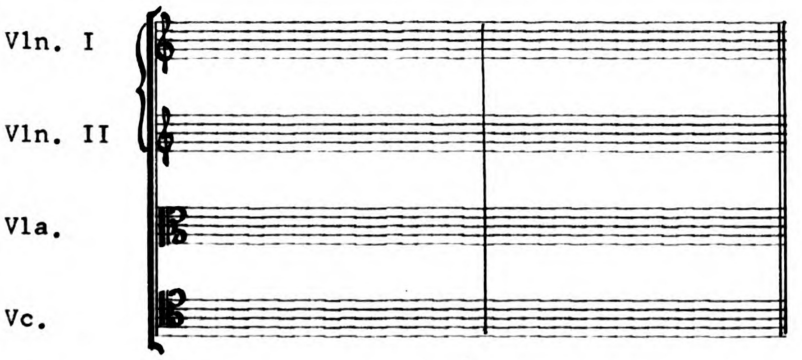
(Answer on next page.)

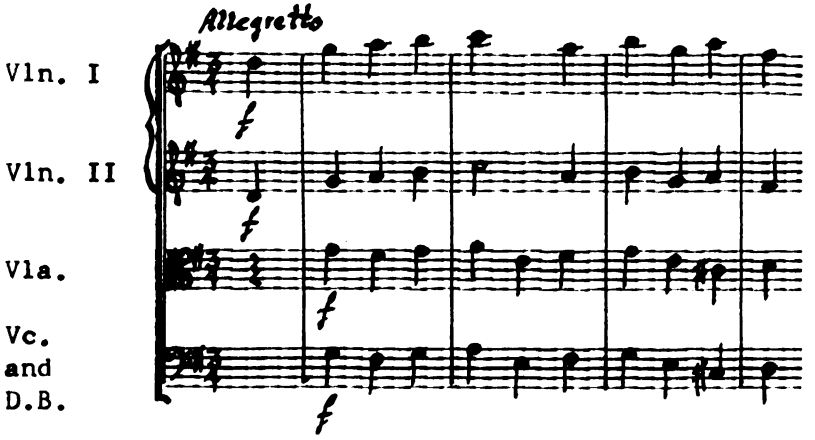


Score the following example on the staves provided. The melody is in the cellos. The double basses are resting.

Divertimento for String Orchestra — Bartok



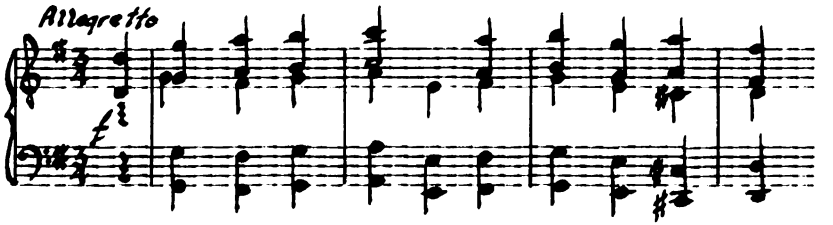




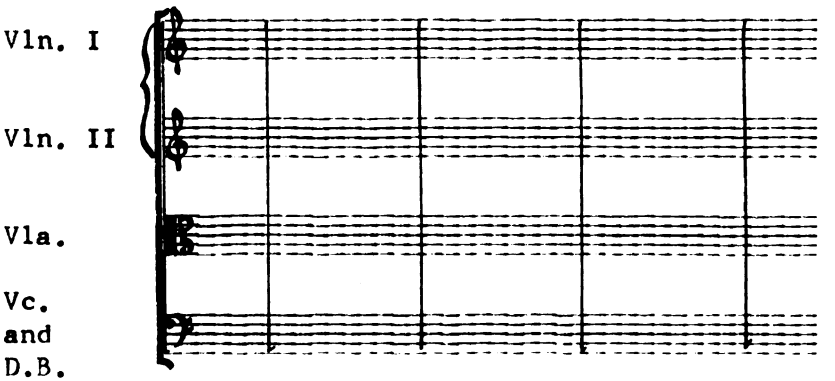
98.

A melody with accompaniment may also employ octave doubling. The following example illustrates a melody and accompaniment of only two voices, each voice doubled in octaves.

Eine Kleine Nachtmusik — Mozart



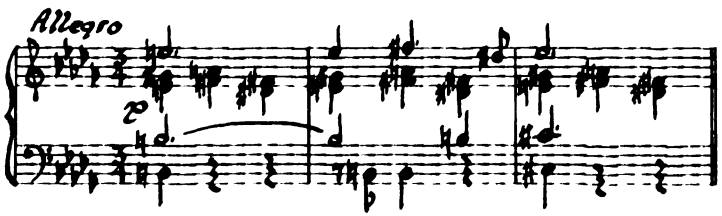
Score the above example on the staves below. Put the melody in the first and second violins.



99.

Octave doubling of inner parts is also found in this type of texture. Score the following excerpt doubling the melody at the octave above and also, the "first tenor", and bass at the octave below. Do not double the "second tenor." Divisi is required in all parts except the double basses. Keep the melody in the first violins.

Serenade for Strings — Dvořák



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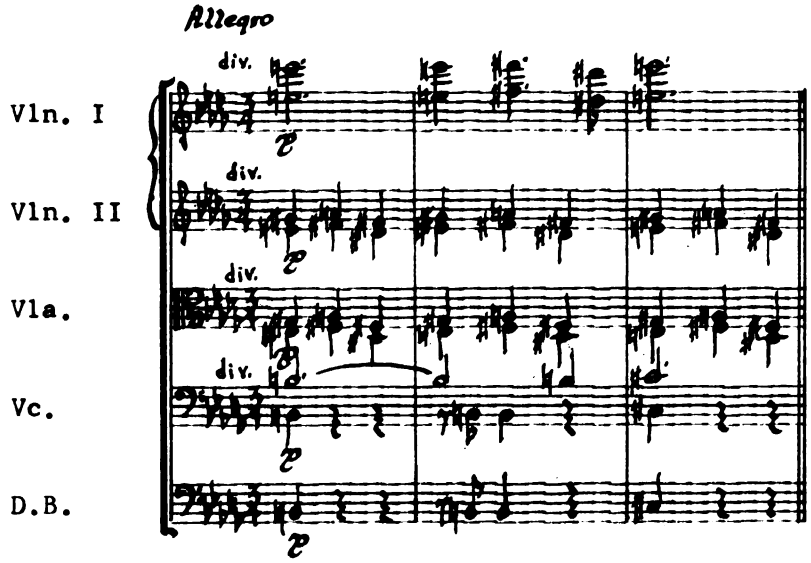
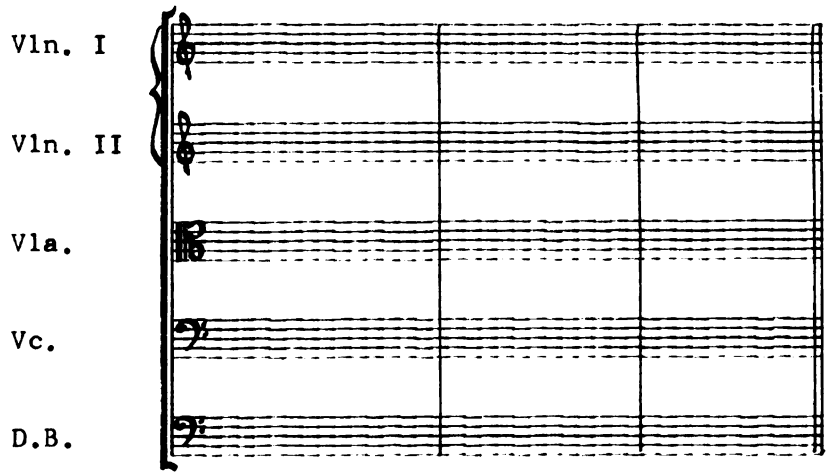
(Answer on next page.)



(Answer on next page.)

100.

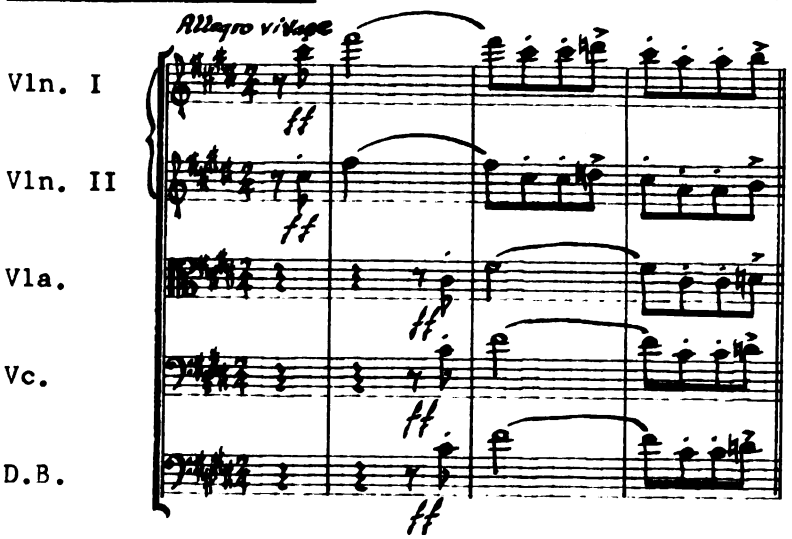
Whereas the homophonic texture consists of only one voice that is melodically significant, the polyphonic texture is made up of more than one melodic voice. The most obvious type of polyphonic texture is imitation. The following example illustrates a two-voiced, imitative texture, doubled in octaves.



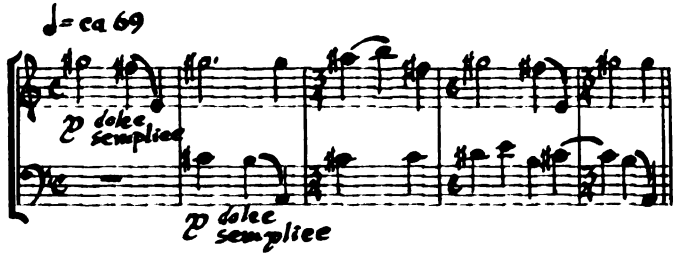
(Continued on next page.)

polyphonic

Sernade for Strings — Dvořák



Imitation is the most obvious type of _____ texture.



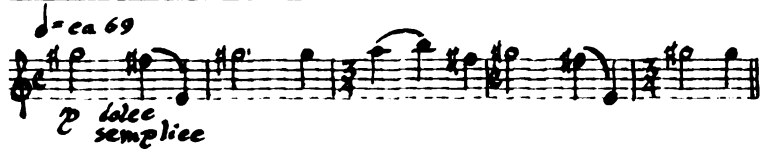
"Hollow" or "empty".

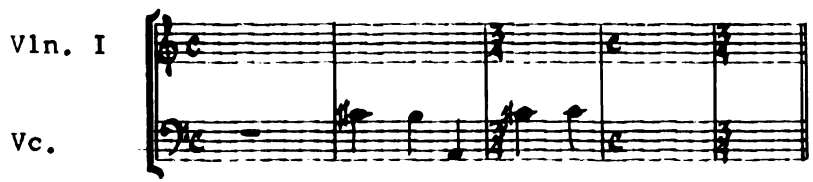
(Or equivalent.)

101.

The following excerpt uses open voicing for effect. The violin melody which is given is imitated exactly in the cellos at the twelfth below. Score this example for Violin I and Cello on the staves provided. Be sure that the rhythm of the cello part is identical to the violin melody.

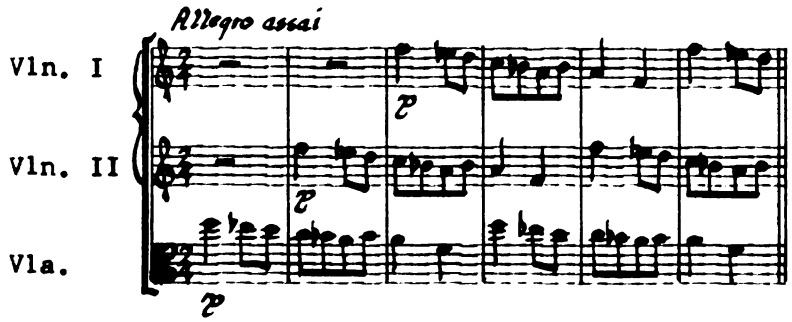
Two Pieces for String Orchestra — Copland





102.

This open voicing will produce a sound very similar to open voicing of a monophonic texture in open-voiced octaves. Describe briefly that sound. _____

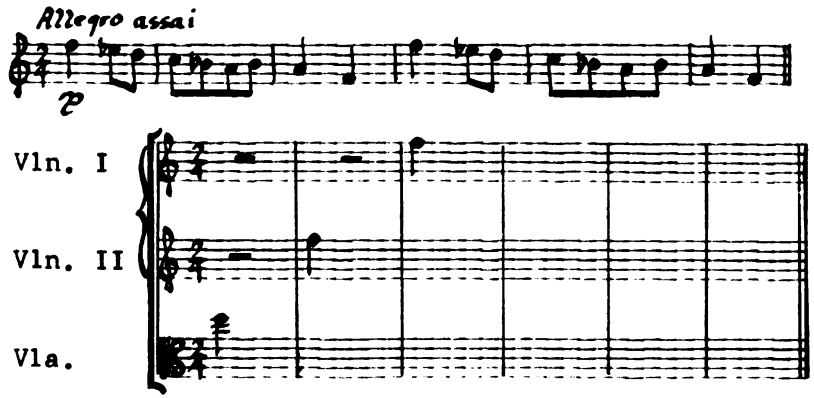


(Answer on next page.)

103.

The following line is imitated twice at the unison after one measure. The theme begins in the violas. Score this example on the staves below.

Divertimento for String Orchestra — Bartok



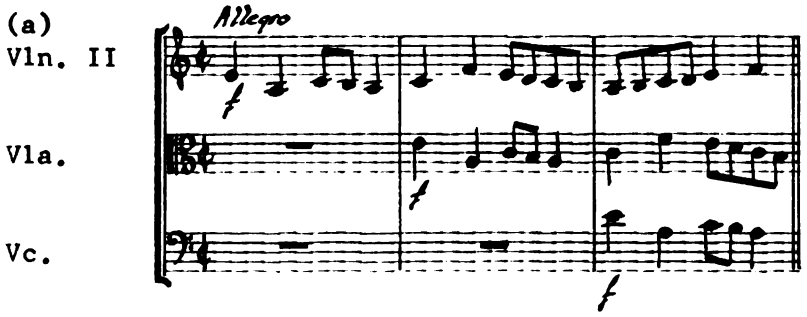
104.

Imitation at the unison as in the above example will produce a "crowded" or "busy" effect. Any dissonances which occur will tend to sound more severe because all voices are within the same octave.

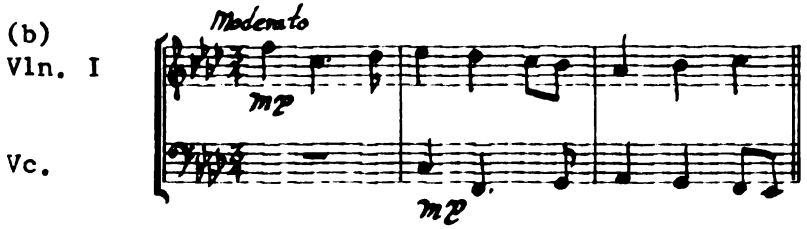
(Continued on next page.)

Which example below will produce a "crowded" or "busy" effect?

(a)



(b)



Answer: _____

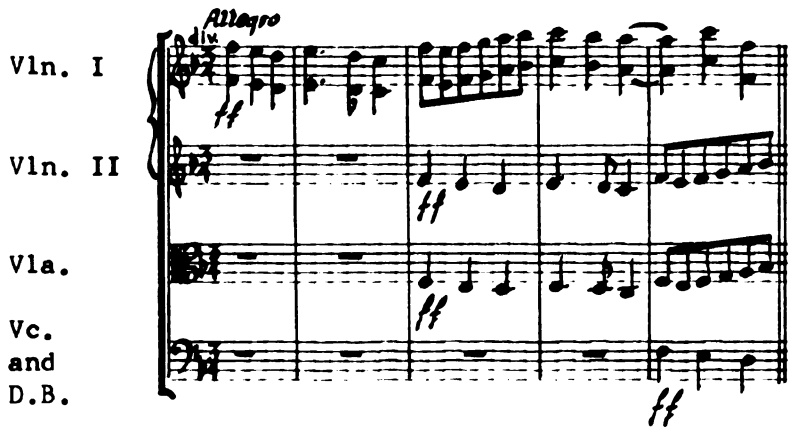
(a)

105. Describe the sound of example (b) above. _____

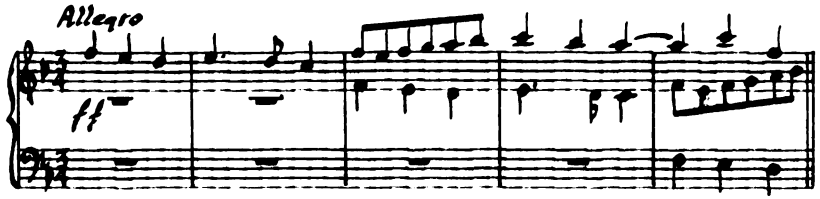
_____

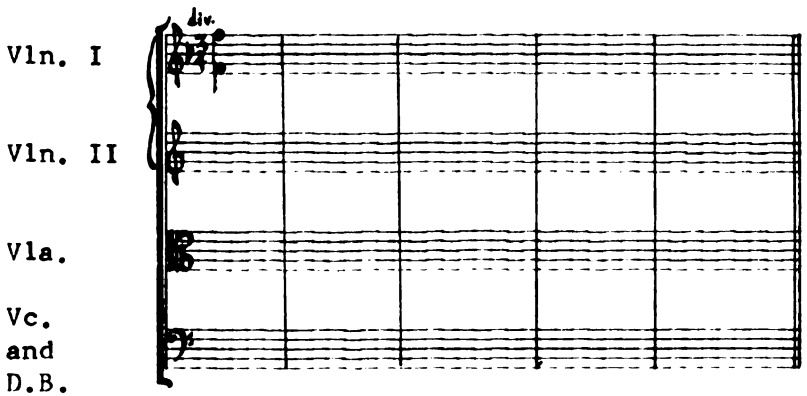
"Hollow" or "empty".

(Or equivalent.)



106. Imitative voices may also be doubled in octaves as in the example in Frame 100. Score the following example with each voice doubled at the octave below. Use divisi only in the first violins.

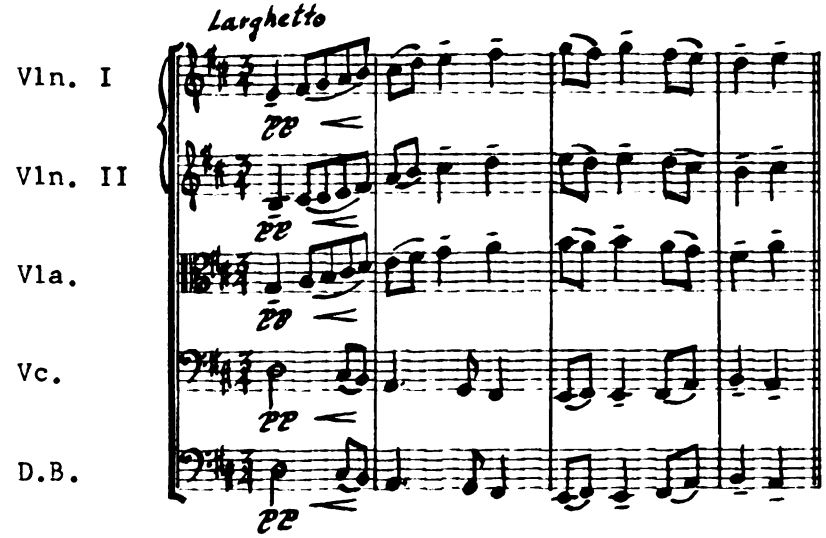




Full and massive (Or equivalent.)	107. Eight-voiced octave doubling of a polyphonic passage will achieve essentially the same effect as the same doubling applied to a homophonic texture. In one or two words, describe this sound. _____
imitative (and) polythematic (Any order.)	108. Imitative polyphonic texture consists of one thematic idea. It is also possible to have a polyphonic texture made up of two different thematic ideas. This type of polyphonic texture is called polythematic. Two types of polyphonic texture are _____ _____ and _____.
(Answer on next page.)	109. The following example illustrates a polythematic texture. One theme is harmonized in the violins and violas. The second theme is stated in octaves in the cellos and basses. (Continued on next page.)

(Answer on next page.)

Serenade for String Orchestra Tschaikovsky



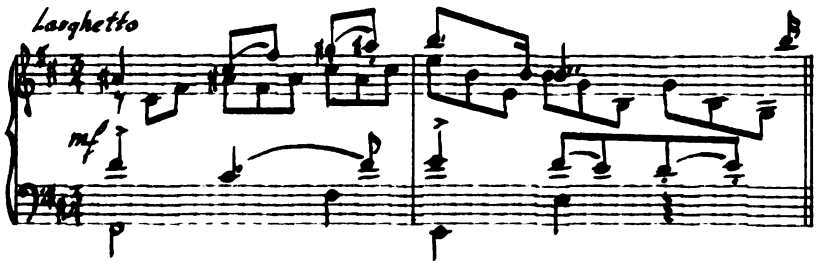
In this example the two themes are very similar to each other.

The following example contains two themes that are quite different in character.

(Continued on next page.)

Soprano and tenor.

Serenade for String Orchestra — Tschaikovsky

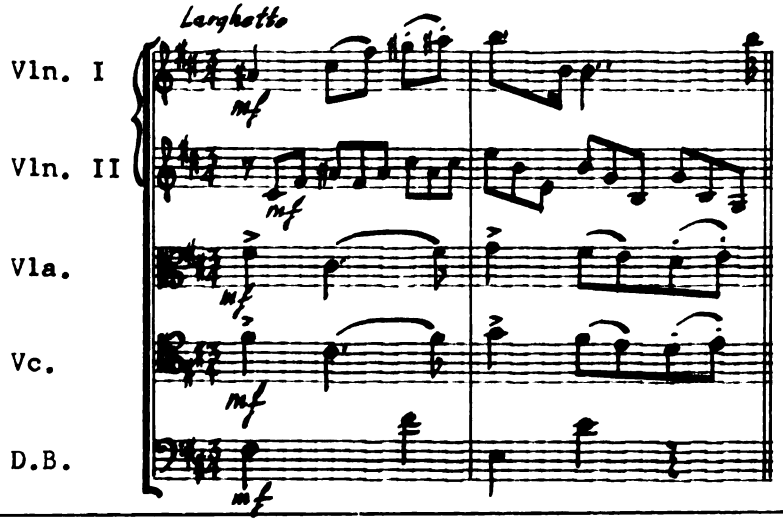


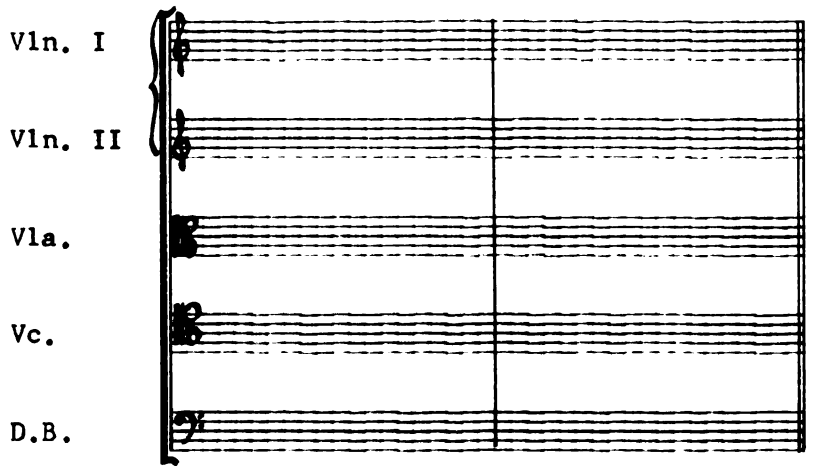
In terms of soprano, alto, tenor and bass, which voices in the above example have the two themes?

_____

110.

Score the second example in Frame 109 on the staves below. Double the "tenor" theme in the violas and cellos.



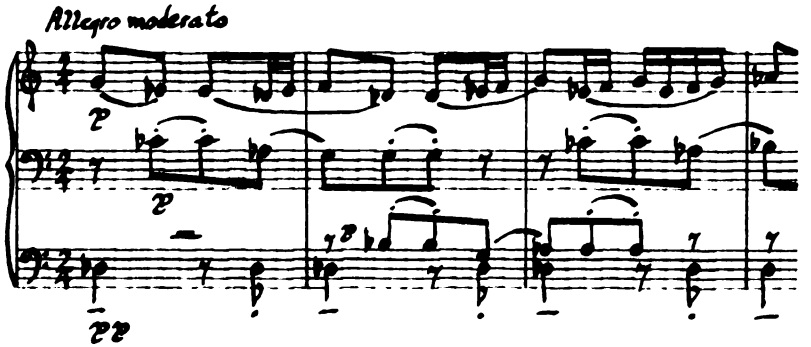


111.

The preceding example actually contains a combination of textures. The second violin part serves as an accompaniment to the first violins theme. Such combination of elements from various textures produces highly interesting scores.

The following example is not only polythematic but the second theme is treated in imitation.

Music for Strings — Porter



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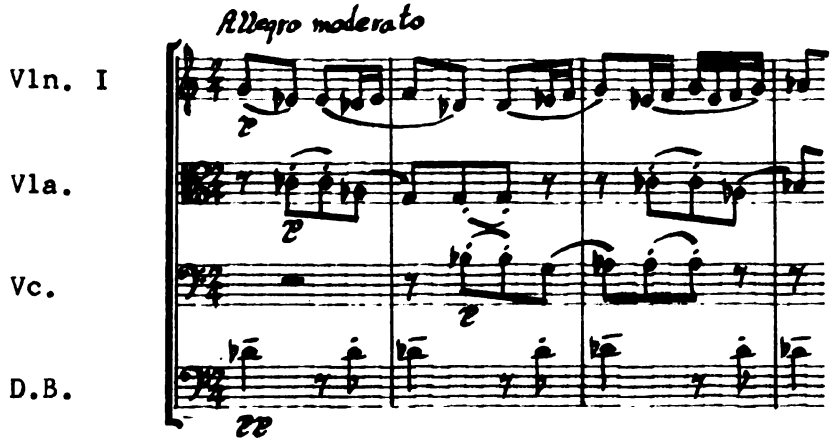
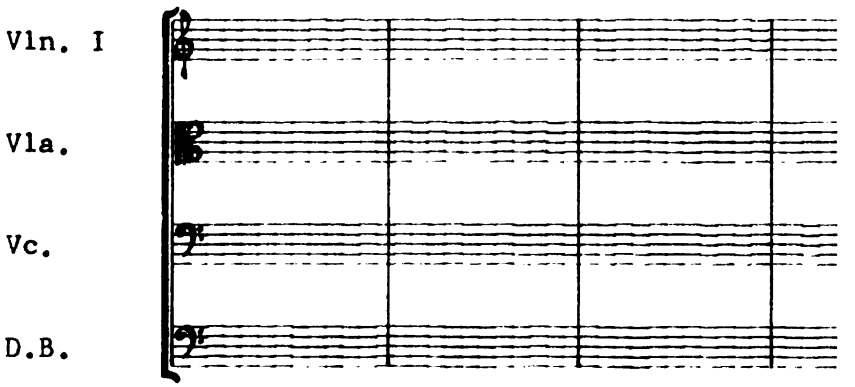
(Answer on next page.)



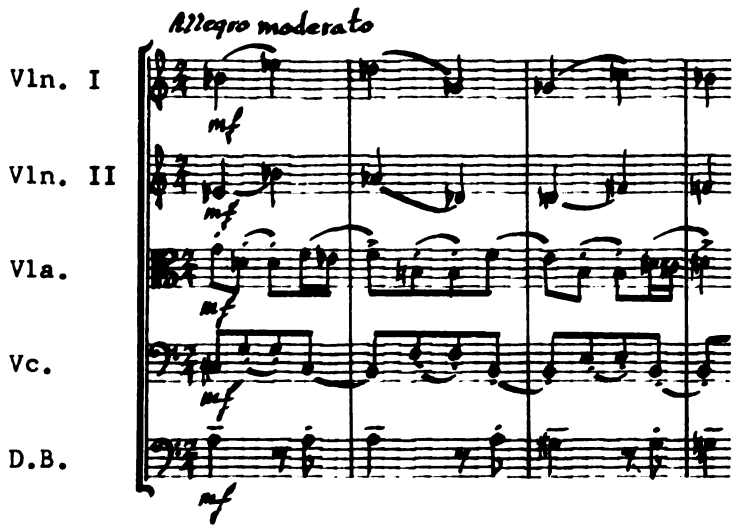
imitative (and) polythematic

(Any order.)

Score the preceding example for the instruments indicated below.



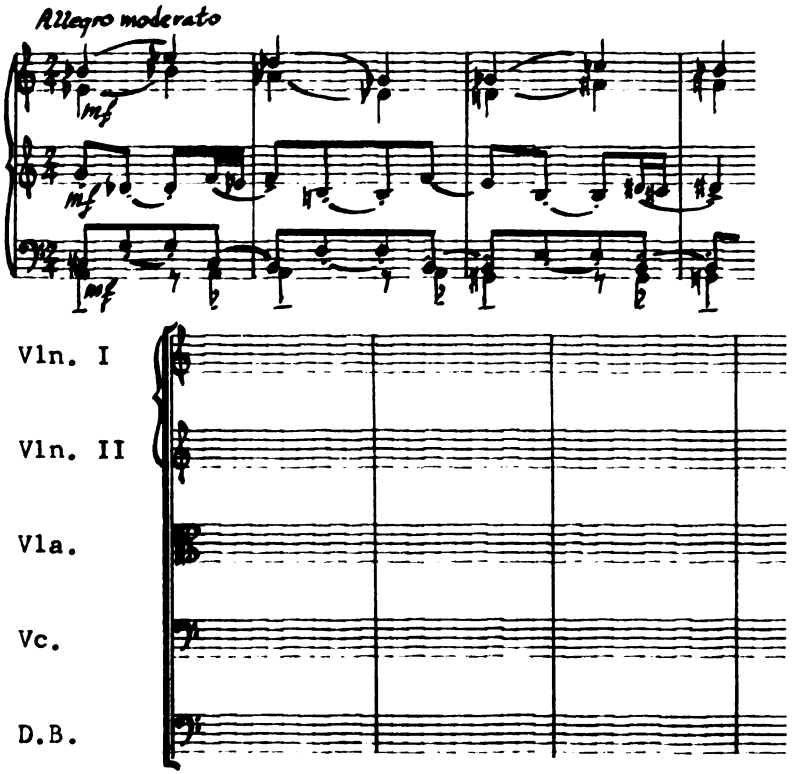
112. The above example contains both _____ and _____ types of polyphonic texture.



113.

Score the following <u>polythematic</u> passage on the staves provided.

<u>Music for Strings</u> Porter



114. List the three principal orchestral textures on the lines below.

monophonic _____

homophonic _____

polyphonic _____

---

115. On the line following each of the sub-types of texture below, write the name of the principal texture of which it is a type.

(a) monophonic

(b) polyphonic

(c) homophonic

(d) homophonic

(e) polyphonic

(a) unison _____

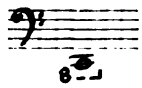
(b) polythematic _____

(c) chorale _____

(d) melody with accompaniment _____

(e) imitative _____

Summary

The string orchestra presents the orchestrator with a wider range of pitch and timbre possibilities than any other homogeneous instrumental ensemble. The overall sounding pitch range of the professional string orchestra is  through  and the many special effects possible on stringed instruments present an incomparable palette of instrumental colors from which to choose. The standard string orchestra score includes five sections: first violins, second violins, violas, cellos, and double basses.

The rudiments of scoring for string orchestra can best be understood in terms of the three basic musical textures: monophonic, homophonic, and polyphonic. Each of these can be broken down further into various sub-types. Monophonic texture is defined as a texture of one voice. This one voice may be scored as a unison or in octave doublings. The two basic sub-types of homophonic texture are chorale style, and melody with rhythmically independent accompaniment. Polyphonic texture can be broken down into imitative and polythematic textures. Various combinations of these textures are, of course possible, (ie. melody with imitative accompaniment) but are more apt to be found in full orchestra scores where the orchestrator has more instruments (hence more voices) with which to work.

It is, of course, impossible to cover all of the scoring possibilities for the string orchestra (or any ensemble) in a

textbook. The student is therefore encouraged to attempt other and longer exercises in scoring and to experiment with other voicing possibilities. The best way to evaluate results is to hear your score performed. Inasmuch as this is seldom possible, consultation with an experienced conductor or teacher of orchestration is recommended as an alternative method of evaluation.

Chapter VIII

Results of the Preliminary Evaluation

The preliminary evaluation of this programmed course of instruction was done during the Winter and Summer terms of 1967. The same subject matter was presented to an experimental group via the programmed material and to a control group via traditional classroom methods.

The progress of the experimental group throughout the course of instruction was regularly monitored in two ways. First an item count of correct initial responses in each student's copy of the text was made. Frames producing a predominance of incorrect initial responses were marked for revision. The results of this item count show a correct initial response rate of 97.95%. Forty-one frames were marked for revision.

The second method of monitoring class progress in the experimental group was spot checking through oral classroom drill and question and answer sessions which permitted the author to make a subjective evaluation of material retention and to spot frames which produced a correct initial response without sufficiently illustrating why that response was correct.

Overall retention of subject matter was tested by giving the same final examination to both the experimental and control groups. The results of this testing are as follows: The first experimental group attained a mean test score of 87.5% as opposed to a mean score of 82.5% in the corresponding control group. The second experimental group attained a mean test score of 89% as opposed to a mean score of 75.5% in its corresponding control group.

These results would seem to indicate that better results are achieved through the use of programmed material than with a conventional lecture presentation. There are two significant reasons, however, why these results cannot be interpreted as conclusive. The first, and most obvious reason is the small number of students involved in the two testing situations. Only twenty-seven students were used in this experiment. A second, and equally important reason is the unequal general academic and musical ability of the test groups. Students for both experimental groups were chosen on a voluntary basis. In the subjective judgment of the instructors from whose classes these students were drawn, the better overall students tended to volunteer for the experimental groups. This predominence of generally more conscientious and able students in the experimental groups undoubtedly raised the mean scores of their groups unproportionally.

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