S5 Music Practice Paper (Set 1): Pitch and Frequency, Note Values, Metre and Tempo, Intervals and Scales, Chords and Harmony, Musical Form, Instrument Classification and Concert Economics

Senior Secondary Music

S5 Music Set 1: 24 parts, 100 marks, 60 min on pitch, equal temperament, note values, metre, tempo, intervals, triads, inversions, form and concert economics.

Question 1: Pitch, Frequency and Note Values

Calculate each of the following and state the units where required.

#	Question
1	The international standard pitch is A4 = 440 Hz. Find the frequency (Hz) of A5 one octave above and A3 one octave below.
2	Seven semitones above A4 in equal temperament: use f = 440 x 2^(n/12) to find the frequency (1 decimal place).
3	A just fifth has the ratio 3:2, giving 660.0 Hz above A4. Using cents = 1200 x log2(f_just / f_et), find the gap against equal-tempered E5 (2 decimal places).
4	In 4/4 how many sixteenth notes equal one whole note? If all 24 bars of a piece are whole notes, how many sixteenth notes is that in total?

Question 2: Metre, Bar Duration and Tempo

Show your working in each part.

#	Question
5	A 6/8 bar holds six quavers. If the dotted crotchet (two quavers) is the beat unit, how many beats are there in one 6/8 bar?
6	At 80 BPM counted in dotted crotchets, find the duration of one 6/8 bar in seconds (2 decimal places).
7	A 4/4 bar already contains a crotchet, a quaver and a semiquaver, i.e. 1.75 beats. The remainder is 2.25 beats: check whether 4 quavers plus 1 semiquaver fill the bar exactly.
8	The same passage is played at 126 BPM instead of 90 BPM. Find the percentage increase (1 decimal place) and the new beat duration as a fraction of the original (3 decimal places).

Question 3: Scale Structure and Intervals

Answer in semitones and name each interval.

#	Question
9	The C major scale follows the pattern tone-tone-semitone-tone-tone-tone-semitone. State the number of semitones in an octave, and the semitone count and name of the interval from C to G.
10	Middle C (C4) = 261.63 Hz. Using equal temperament, find E4 four semitones above (1 decimal place).

#	Question
11	Two notes are 9 semitones apart. Name the interval, explain how it differs from 8 semitones (minor sixth), and state the semitone count from C to A.
12	Compare the pentatonic (5 notes), whole-tone (6) and major (7) scales. Find the percentage of the 12 semitones in an octave used by the pentatonic scale (1 decimal place).

Question 4: Triads, Inversions and Harmony

Justify your answers with semitone structure.

#	Question
13	A major triad is a root, a major third (4 semitones) and a perfect fifth (7 semitones). With C4 = 261.63 Hz as the root, find the frequency of G4 (1 decimal place).
14	A minor triad is a minor third (3 semitones) plus a perfect fifth (7 semitones). With A4 = 440 Hz as the root, find the third C5 (1 decimal place) and state how many semitones separate a minor and a major third.
15	A 32-bar piece uses the progression I-V-vi-IV with the four chords shared equally. Find the bars and percentage for each chord (1 decimal place).
16	Write the three notes of a first-inversion C major triad (C-E-G) from top to bottom and state how many semitones separate the bass from the root. Why do composers use inversions?

Question 5: Musical Form, Proportion and Structure

Show working and give the units.

#	Question
17	A binary-form piece has section A (8 bars) and section B (8 bars), each repeated once. Find the total number of bars played.
18	The piece is in 4/4 at 100 BPM. Find the bar duration and the total playing time in seconds (1 decimal place), then express it in minutes and seconds.
19	A sonata-form movement has 240 bars: exposition 40%, development 30%, recapitulation 30%. Find the bars in each part and check the total.
20	Another piece has sections A:B:C in the ratio 5:3:2 over 200 bars. Find the bars in each section and how many times longer the longest is than the shortest.

Question 6: Instrument Families, Listening and Concert Economics

Show your working; all money is in Hong Kong dollars.

#	Question
21	Classify these eight instruments by the Hornbostel-Sachs system (chordophone, aerophone, idiophone, membranophone): violin, cello, classical guitar, flute, clarinet, trumpet, xylophone, timpani. Give the count in each family.

#	Question
22	A hall has 800 seats and a concert is 85% full. Find the audience and the box-office take at $280 per ticket (HK dollars).
23	The concert costs HK$150,000 in total. Find the break-even audience (rounded up to a whole person) and the actual profit (HK dollars).
24	A student practises 5 days a week for 45 minutes a day. Find the weekly minutes and hours (2 decimal places); at this rate how many years are needed to reach 10,000 hours (1 decimal place)?

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