

MAT 120

Quiz 5

Fall 2021

1. Suppose a function (or signal) is the product of two sinusoids: $f(t) = \sin(2\pi 220t) \sin(2\pi 3t)$. How many beats (amplitude oscillations) per second does this produce?

a) 2 b) 6 c) 4 d) 1 e) 8

Correct Answer: 6

2. Same function f as in the previous problem. What is the audible frequency?

a) 3 Hz b) 6 Hz c) 440 Hz d) 880 Hz e) 220 Hz

Correct Answer: 220 Hz

3. Same function f as in the previous problem. One of the factors is a Low Frequency Oscillator. What is the length of one period of that LFO?

a) $\frac{1}{3}$ b) $\frac{1}{2}$ c) $\frac{1}{6}$ d) $\frac{2}{3}$ e) 2

Correct Answer: $\frac{1}{3}$

4. Suppose a perfect fifth with frequency ratio $\frac{3}{2}$ is used to tune a piano starting at A220 Hz, using the method of going up a fifth, then down by octaves whenever we go past A440 in order to keep the notes within one octave. How far off from Equal Temperament will the note B be, in cents?

a) 5 b) 2 c) 1 d) 4 e) 3

Correct Answer: 4

5. Same tuning as in the previous problem. If we leave A440 as a perfect octave, and tune all the other pitches, what will the cent value of the semitone from $A\flat$ to A be?

a) 10 b) 90 c) 80 d) 110 e) 120

Correct Answer: 90

6. Same tuning as in the previous problem. The tonic major triad in the key of A has a major third which can be described by which frequency ratio?

a) $\frac{81}{64}$ b) $\frac{5}{4}$ c) $\frac{32}{25}$ d) $\frac{7}{5}$ e) $\frac{7}{6}$

Correct Answer: $\frac{81}{64}$

7. Same tuning as in the previous problem. What is the last note to be filled in, by using the process of going up by fifths and down by octaves?

a) D b) F c) $A\flat$ d) $E\flat$ e) C

Correct Answer: D

8. Same tuning as in the previous problem. The last note to be filled in is very sharp to Equal Temperament. What is the cent value difference to Equal Temperament?

a) 25 b) 32 c) 40 d) 22 e) 16

Correct Answer: 22