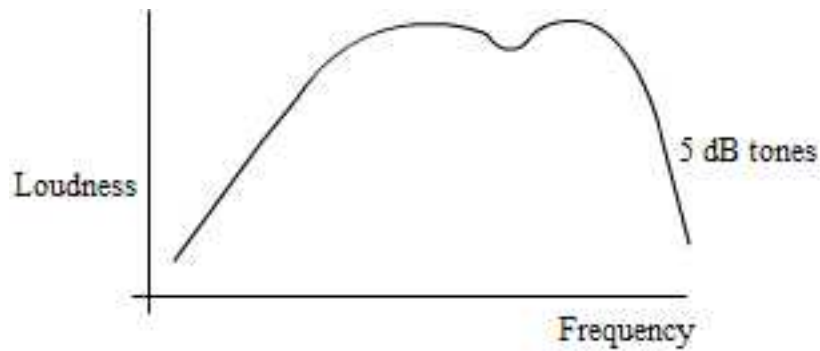
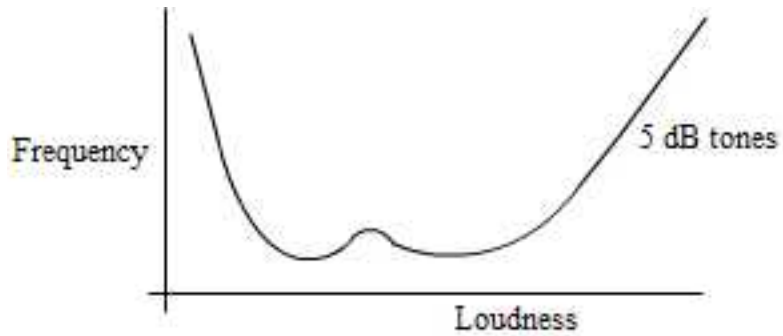


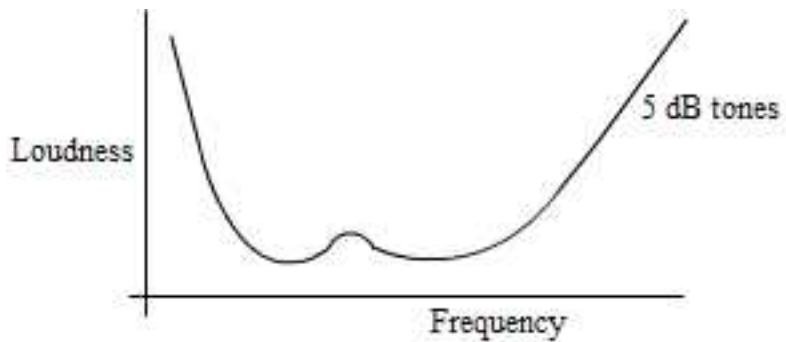
### Week 3: Assignment Solution

- Two source of speech signal producing a vowel /o/. The formant frequencies of the sources are differing by 3-4%. If a human being perceives the two sounds what will happen?
  - Two sounds will perceives as same
  - Higher formant frequencies sound will be louder than the first one
  - Two sounds will perceives as different sound
- Suppose an electric fan produces an intensity of 40 dB. How many times more intense is the sound of a conversation if it produces an intensity of 60 dB?
  - 100
  - 20
  - 50
  - 120
- Which one of the following is the perceptual parameter of speech?
  - Fundamental Frequency
  - Loudness
  - Intensity
  - Formant Fundamental
- Which one of the following an equal loudness curves for 5 dB.





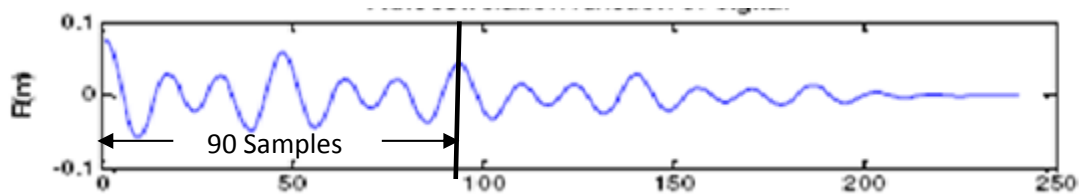
B.



C.

5. Which of the following tones is perceived as louder tone?
- (a) 10 dB level at 500Hz
  - (b) 10 db at 200 Hz
  - (c) 10 dB level at 1 KHz**
  - (d) 10 dB level at 8 KHz
6. Number of zero crossing rates is extracted from 20ms segment of each of the following speech signal. Which one has higher number of zero crossing?
- (I) Bilabial Fricative
  - (II) Bilabial Nasal murmur
  - (III) Vowel /a/
- A. (II)
  - B. (I)**
  - C. (II) and (III)
  - D. (I) and (II)

7. 5 kHz sinusoid signal is sampled at 12kHz determine the number of zero crossing in 50 ms segment
- A. 200
  - B. 30
  - C. 300**
  - D. 1000
8. The following figure represent the plot of an autocorrelation coefficient of an speech segment determine the fundamental frequency of the speech segment if the speech signal is recorded with 16 kHz sampling frequency



- A. Range of 86 to 90 Hz**
  - B. Range of 91 to 95 Hz
  - C. Range of 96 to 100 Hz
  - D. Range of 80 to 85 Hz
9. Acoustic intensity of an audio system is 130dB. Find out the Loudness (L) in Sones. Where

$$L = 445I^{0.33}$$

- A. 951 Watt/m<sup>2</sup>
  - B. 120 Watt
  - C. 951 Sones**
  - D. 445 Sones
10. What will be value of perceive pitch (in Mel Scale) for the 180 Hz tone

$$\text{Pitch (in Mels)} = 1127 \log_e \left( \frac{f}{700} + 1 \right)$$

- A. Range of 255 to 260 Mels**
- B. Range of 250 to 254 Hz
- C. Range of 255 to 260 Hz
- D. Range of 200 to 205 Mels