

M. Sc. (Audiology) (2018 Course) Sem – I : SUMMER - 2019

SUBJECT: TECHNOLOGY IN AUDIOLOGY

Day: Thursday
Date: 23/05/2019

Time: 10.00 AM TO 01.00 PM
Max. Marks: 80

S-2019-3977

N.B.:

- 1) Both questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.

Q.1 Attempt any FOUR questions out of SIX: (15 Marks each) (60)

- a) What is the sampling theorem? What is the difference between sampling and quantization? What is quantization error? How does the number of bits of a quantizer affect the quantization error and data size?
- b) What is Amplitude Modulation (AM) and Frequency Modulation (FM)? Why are those used in communication? How is AM related to speech signal and cochlear implant?
- c) What does EEG and MEG measure? Compare advantages and disadvantages of the two techniques.
- d) What is a narrowband spectrogram? Compare its resolutions and time window length with those of a wideband spectrogram. Which part of the speech signal is best observed in a narrowband spectrogram?
- e) Explain the source-filter model of speech production. Which parts of the speech signal are modeled by the source and the filter? How would the source and the filter change for an unvoiced sibilant fricative versus a vowel?
- f) Explain the working principal of CT and PET scans. How is SPECT different from PET?

Q.2 Attempt any FOUR out of SIX: (5 Marks each) (20)

- a) Which auditory/ executive functions do different regions of an ERP response relate to?
- b) What is the Fourier transform of the impulse response of a system called? For a linear system, how is the output calculated from the input and the impulse Response?
- c) Why is intra-operative monitoring used?
- d) What is the difference between talker identification and talker verification? Give one application of each.
- e) Briefly describe various speech synthesis techniques.
- f) What is synchronous and asynchronous teleaudiology?

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