MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

FOURTH SEMESTER B.Tech. (PME) DEGREE END SEMESTER EXAMINATION
April 2018
SUBJECT: Audio and Video Signals (ECE - 2231)

TIME: 3 HOURS   **MAX. MARKS: 50**

Instructions to candidates
- Answer **ALL** questions.
- Missing data may be suitably assumed.

1A. Explain how data streams can be classified based on
   i) Time interval between successive packets.
   ii) Amount of data in successive packets.
1B. What is QoS? Mention the 3 QoS Layers and its parameters.
1C. Define the Batching and patching techniques of IP based multicast approach.

(5+3+2)

2A. What is the importance of synchronization in multimedia systems? Also explain different types of synchronization.
2B. Draw the block diagram of digital model of speech production and explain the function of each blocks
2C. i) Find the minimum sampling frequency required to sample the signal

$$x(t) = 2\cos(1000t)\cos(2500t) + 3\cos(2\pi 5000t)$$

ii) If this signal is passed through a LPF with cut-off 800Hz, what is the sampling frequency required to sample the resulting signal?

(5+3+2)

3A. Obtain the Huffman code for set of symbols (a, b, c, d, e, f) which occur with probability (0.45, 0.12, 0.13, 0.5, 0.09, 0.16) respectively. What is the amount of compression achieved compared to binary codes?
3B. Define media. Explain the different media available.
3C. Briefly explain the working of an omnidirectional microphone.

(5+3+2)

4A. Draw the human speech production mechanism and explain the role of each part?
4B. Write a note on H.261 video coding standard.
4C. Find the file size of a standard CD quality stereo audio file with sampling frequency 44.1KHz and bit depth of 16bits/sample and duration 20 minutes.

(5+3+2)

5A. With a block diagram explain the MPEG video coding standard.
5B. Mention and explain the key requirements of a video conferencing systems
5C. What is audio latency? Explain the factors that decide audio latency.

(5+3+2)