Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

IV SEMESTER B.TECH (PRINT AND MEDIA TECHNOLOGY)

MAKEUP EXAMINATIONS, JUNE - JULY 2016

SUBJECT: AUDIO AND VIDEO SIGNALS [ECE - 2231]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable 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. Define media. What are the different media available? Explain.

1C. Briefly explain the working of a unidirectional microphone.

[05 + 03 + 02]

2A. **i.** Explain the speech production mechanism by mentioning the role of each part?

ii. Give the plot of typical glottal waveform and define pitch period.

2B. What do you mean by horizontal and vertical resolution of a video camera? Explain its significance.

2C. Consider an audio signal with maximum frequency component of 6.2KHz, which is passed through a low pass filter (LPF) with cut off frequency of 4.1KHz. What is the minimum sampling frequency required to sample;

i. Signal at output of the filter.

ii. Signal at input of the filter.

[05 + 03 + 02]

3A. With a neat block diagram, explain MPEG audio compression technique.

3B. Consider a document which is to be scanned using a scanner with resolution 120dpi. The first three pages are scanned using colour scanning and next four pages are scanned using grey scale scanning. Assume the size of each page is 15inchX12inch.

i. Find the size of resulting file.

ii. If Bi level image compression is used only on last four pages of the document, what will be resulting file size?

3C. Briefly explain the use of Differential pulse code modulation (DPCM) in audio coding.

[05 + 03 + 02]

4A. With a neat block diagram, explain JPEG compression technique.

4B. Obtain the Huffman code for set of symbols (a, b, c, d, e, f) which occur with frequency (44, 12, 13, 5, 9, 27) respectively.

4C. Consider an uncompressed video file with frame size of 640x480 (WxH) at a colour depth of 24 bits. If frame rate if 30fps and total file size is 4.866×10^9 bits, find the duration of the video file.

[05 + 03 + 02]

5A. Write a note on Multimedia conferencing. Also mention its advantages and applications.

5B. What is audio latency? Explain the factors that decide audio latency.

5C. Explain key limitations of progressive streaming.

[05 + 03 + 02]