Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VI SEMESTER B.TECH. (INFORMATION TECHNOLOGY / COMPUTER AND COMMUNICATION ENGINEERING)

END SEMESTER EXAMINATIONS, APR/MAY 2017

SUBJECT: PROGRAM ELECTIVE – II : MULTIMEDIA COMMUNICATIONS [ICT 4002]

REVISED CREDIT SYSTEM
(27/04/2017)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- Answer ALL the questions.
- Missing data may be suitably assumed.

1A. Encode the string *AMAMI$* using Arithmetic coding and find its binary representation. Also decode the binary representation value. Probability distribution of characters are given in Table Q.1A. 5

Table Q.1A

Character	Probability	Range
M	0.2	[0, 0.2)
I	0.1	[0.2, 0.3)
T	0.3	[0.3, 0.5)
A	0.4	[0.5, 0.9)
$	0.1	[0.9, 1)

1B. Classify the media based on different criteria specified by ISO. 3

1C. State Nyquist theorem. Also with a suitable example give intuition behind it. 2

2A. Based on Table Q.2A, check whether the given set of tasks schedulable using Earliest Deadline First (EDF) and Rate Monotonic (RM) algorithms. Show the schedule diagrammatically. 5

Table Q.2A

Process	Period/Dead Line	CPU Time
A	20	10
B	20	5
C	20	5

2B. Explain in detail the experimental environment set up for understanding Lip and Pointer Synchronization error. Mention in-synch, transient and out-synch regions in both the cases. 3

2C. Is RTP best suitable for multimedia data transmission? Does RTP guarantee real time delivery of packets and QoS? Justify your answer. 2

3A. Using adaptive Huffman coding encode the data *MITITMUMMI*. Calculate the average number of bits needed to represent each character and compare the result with Entropy of the information. 5

3B. Write an algorithm for LZW encoding and decoding. 3

3C. Explain GIF and TIFF format. 2

4A. Encode the following data using DPCM encoding.
200, 250, 200, 300, 350, 300, 200, 250
Make use of default predictor function and use the quantization equation given below. 5
$Q(e_n) = 16 * \text{trunc}[(255 + e_n)/16] - 256 + 8.$

4B. Explain how is error concealment and resilient techniques applied in MPEG. 3

4C. Using 2D-DCT find DC and highest frequency AC coefficient for the data given in Table Q.4C. 2

Table Q.4C

100	100	100
100	100	100
100	100	100

5A. Explain JPEG compression technique in detail 5

5B. Differentiate between H.264 and MPEG 4 encoding techniques. 3

5C. Consider a speech recognition system with individual word recognition probability as 0.97. Is this system good for recognizing a sentence with 10 words? Justify your answer. 2