Sl. No.

C6-R4 : MULTIMEDIA SYSTEMS

NOTE :
1. **Answer question 1 and any FOUR questions from 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Time : 3 Hours   **Total Marks : 100**

1. (a) Why do we need multimedia file systems ?

   (b) Explain Still Image Compression.

   (c) What is MIDI ? What are the two main kinds of MIDI messages ?

   (d) What are the basic characteristics of temporal and non temporal media ?

   (e) What is the distinction between lossy and lossless data compression ?

   (f) Briefly discuss the Earliest Deadline First resource scheduling.

   (g) One simple approach to video compression is to compress each frame of the video using the JPEG pipeline. Briefly discuss what disadvantages of this simple approach make it an unpopular choice as a video compression standard ?   **(7x4)**

2. (a) Consider the following block of frequency domain values from a video frame arising during MPEG compression :

196	207	1	129
1	7	129	199
11	73	73	194
75	78	139	135

   Apply successively to this block : (i) MPEG quantisation using a constant quantisation value of 64, (ii) Zig-zag scanning, and (iii) Run length encoding.

   (b) A certain source emits symbols {A, B, C, D, E} with corresponding probabilities $P(A) = \frac{3}{50}$, $P(B) = \frac{24}{50}$, $P(C) = \frac{1}{50}$, $P(D) = \frac{10}{50}$, $P(E) = \frac{12}{50}$. Derive the Huffman code for each symbol. Estimate the Shannon entropy of this source. Estimate the average number of 1's and 0's required to encode symbols from the above source using the Huffman codes you derived.   **(9+9)**

3. (a) Briefly discuss SMIL and SMIL documents. Give the list of some of the SMIL players.

(b) In context of Content based video retrieval (CBVR), highlight the factors which should be considered in CBVR which are ignored during content based image retrieval. Also discuss the need for Content based video retrieval system. **(8+10)**

4. (a) Justify the need of additional features to be provided in an Operating System (OS) to support multimedia data. Discuss those features to be provided in an OS to support multimedia data.

(b) Briefly discuss the Real Time Protocol (RTP) and Real Time Control Protocol (RTCP).

(c) Discuss various factors which affect the quality of service (QoS) in multimedia delivery. **(6+6+6)**

5. (a) In context of input and output interfaces to the virtual world, briefly discuss Data gloves or wired gloves and head-mounted displays. Give the list of other common input and output interfaces.

(b) Differentiate between Virtual Reality and Augmented Reality.

(c) Briefly discuss the VRML (Virtual Reality Modeling Language) file format. **(6+6+6)**

6. (a) Discuss how messages can be formatted and delivered in Multimedia Authoring System.

(b) Discuss the mechanism of Voice/Video over IP with an example. **(9+9)**

7. (a) Discuss the ITU (International Telecommunications Union) standards for video conferencing.

(b) Briefly discuss IEEE 1394 (FireWire) and compare it with USB.

(c) Discuss the sound quality in MP3 encoded files. **(6+6+6)**

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