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**B.E./B. TECH. (FULL-TIME) DEGREE END SEMESTER EXAMINATIONS, Nov.'2011**

**INFORMATION TECHNOLOGY**

**V SEMESTER**

**IT9302 – MULTIMEDIA SYSTEMS  
(REGULATIONS 2008)**

**Time:** Three hours

**Maximum:** 100 marks

***Answer ALL questions.***

**PART A – (10X2 = 20 marks)**

1. What is the purpose of Gamma correction in video/image?
2. Out of three properties of sound namely: pitch, loudness, and timbre, which one needs to be encoded more accurately and why?
3. Why MP-3 is popular over MP-1 and MP-2?
4. State the difference of purposes in Video Coding Experts Group of ITU-T and MPEG.
5. What is text/character encoding? Name a modern character encoding scheme.
6. Is authoring system is a software package? Name a most common and popular authoring tool used today in a PC/Laptop.
7. List the two main purposes of OpenGL.
8. Differentiate hypermedia and metamedia.
9. List the four elements of QoS in a multimedia communication network.
10. State the purpose of session initiation protocol.

**PART B - (5X16 = 80 marks)**

11. (i) Present and explain a schematic of support for different elements of multimedia in typical personal computer. (08)
- (ii) What is the difference in approach for speech and audio processing? Sketch and explain the basic steps involved in encoding a speech and audio signal. (08)
12. (a)(i) Explain the H.261 encoding and decoding procedure with block diagrams. (10)
- (ii) List and explain major differences between H.261 and MPEG-1. (06)
- Or**
- (b)(i) Sketch and explain the JPEG coding and decoding algorithm. (12)
- (ii) Compare JPEG and PNG. (04)
13. (a)(i) List and explain important design issues in authoring systems. (10)
- (ii) Categorize multimedia authoring systems into four and explain each. (06)
- Or**
- (b)(i) Draw and explain the simplified pipeline process in OpenGL. (08)
- (ii) Explain the different image processing classes and interfaces in Java. (08)
14. (a) What is the difficulty in handling multimedia using traditional DBMS? List and explain different characteristics of multimedia DBMS.
- Or**
- (b) Consider the following scenario:
- Two workstations are interconnected over internet. A CD player is attached to one workstation. Single channel audio data are transferred from the CD player of this workstation over the network to the other computer. At this remote station, the audio data are delivered to a speaker. Assume standard data for the CD and internet (IPv4 or IPv6) for the computation below.
- (i) Calculate the data rate of CD system in bytes per second. (03)
- (ii) The samples on CD are assembled into frames. These frames are the audio messages to be transmitted. 75 of these audio messages are transmitted per second according to the CD format. Calculate the maximum size of the message (audio data). (03)
- (iii) Calculate the upper bound (maximum) on number of messages that may be encountered considering audio CD. (03)

- (iv) Compute the upper bound on number of messages (Burst) generated at the source. (03)
- (v) Compute the maximum average data considering message length and rate. (02)
- (vi) Estimate the maximum buffer size based on maximum message size and burst at the receiver assuming some message may arrive before time. (02)

15. (a)(i) Sketch and explain a QoS layered model for the multimedia communication systems. (08)
- (ii) Present and explain RTP protocol architecture. (08)

Or

- (b) Explain the following with respect to the video-on-demand.
- (i) Staggered broadcasting
  - (ii) Pyramidal Broadcasting
  - (iii) Harmonic broadcasting
  - (iv) Stream merging

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