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B.E./B. TECH. (FULL-TIME) DEGREE END SEMESTER EXAMINATIONS, Nov.'2013

INFORMATION TECHNOLOGY

V SEMESTER

IT9302 – MULTIMEDIA SYSTEMS

(REGULATIONS 2008)

Time: Three hours

Maximum: 100 marks

Answer ALL questions.

PART A – (10X2 = 20 marks)

1. Compute the bit rate requirement of an uncompressed HD video.
2. What is MP-3 and why it is popular?
3. Name five popular image file format.
4. What is the need for lossy compression techniques when several lossless methods are available?
5. State the difference of purposes in Video Coding Experts Group of ITU-T and MPEG.
6. OpenGL is designed to be implemented mostly or entirely in hardware. Why?
7. Is hypermedia a hypertext? Clarify.
8. State the intended application of MHEG.
9. Differentiate QoS and QoE.
10. Why buffer management becomes an issue in media-on-demand?

PART B - (5X16 = 80 marks)

11. (i) Consider a source of seven symbols with their percentage of occurrence as shown below.

Symbol	Percentage of Occurrence
A	20%
B	10%
C	20%
D	5%
E	30%
F	5%
#	10%

Apply Arithmetic coding algorithm to encode the message **B C C E F #** (08)

(ii) What is the difference in approach for speech and audio processing? Sketch and explain the basic steps involved in acquiring a digital audio signal from a live event. (08)

12. (a)(i) Explain the H.261 encoding and decoding procedure with block diagrams. (08)

(ii) Draw and explain the encoding and decoding procedure to support SNR scalability in MPEG-2 coded video. (08)

Or

(b)(i) Sketch and explain the JPEG encoding and decoding algorithm. (12)

(ii) Compare and contrast JPEG and PNG. (04)

13. (a) Explain the following interface in java with example code.

- (i) ImageProducer
- (ii) ImageConsumer
- (iii) ImageFilter
- (iv) RGBImageFilter

Or

(b)(i) List and explain the design issues of an authoring system.

(ii) Draw and explain the simplified pipeline process in OpenGL.

14. (a) What is the difficulty in handling multimedia data 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) List and explain the four main parameters of quality of service of a multimedia transmission. (06)
- (ii) What is the need for RTP and RTCP protocols? (02)
 - (iii) Explain RTP packet header. (04)
 - (iv) Explain five types of RTCP packets. (04)

Or

- (b) (i) Sketch and explain a general diagram of set-up box in digital video broadcasting. (08)
- (i) Present an optimal plan for transmission rates of media stored on a server. (08)
