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CS – 044

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1047

Roll No.

B. Tech.

(SEM. VIII) EXAMINATION, 2006-07

MULTIMEDIA SYSTEMS

Time : 3 Hours]

[Total Marks : 100

- Note :**
- (1) Answer *all* questions.
 - (2) All questions carry *equal* marks.
 - (3) In case of numerical problems assume *data* wherever not provided.
 - (4) Be precise in your *answer*.

1. Attempt any **four** parts of the following :- **5×4 = 20**
- (a) What are the hardware and software requirements for multimedia computer? Discuss the multimedia applications in business.
 - (b) Distinguish between the following:-
 - (i) Image and graphics
 - (ii) Video and animation
 - (iii) Multimedia production and Multimedia playback.
 - (c) An analog audio signal has a dynamic range of 40 dB. Determine the magnitude of the quantization noise relative to the minimum signal amplitude if the quantizer uses :
 - (i) 6 bits (ii) 10 bits.

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- (d) With a diagram, explain the working of a decoder for digital to analog conversion.
- (e) Discuss the essential components of the video adapter card with their functions.
- (f) How does the process of raster scanning create an image on monitor? How can interlacing be useful for displaying steady images on slower monitors?

2. Attempt any **two** parts of the following :- **10×2 = 20**

- (a) (i) A GIF image occupies a rectangular area of A inch by B inch on a monitor screen. The resolution of monitor is C dpi. What is the file size of the image in kB? The dimensions of the image is A inch × B inch.
- (ii) Calculate the data rate required for a 640×480 resolution color monitor with 10-bit color depth and refresh rate of 30 Hz.
- (b) With a diagram show how MIDI instruments can be interfaced with a PC. In relation to MIDI distinguish between channel messages and system messages giving examples.
- (c) (i) What are the elements of hypertext? How hypertext is different from hypermedia?
- (ii) What is authority tool? Describe the basic characteristics of requirements for selecting a multimedia authority tool.

3. Attempt any **two** parts of the following :- **10×2 = 20**
- (a) Consider the text string “DI\$DID\$DIDI\$DIDIA\$DIDI”. Show all the steps of LZ78 compression and decompression including the dictionary formation.
 - (b) Differentiate between :
 - (i) Bitmap and vector drawing
 - (ii) Lossless and lossy compression
 - (iii) Statistical and dictionary based schemes.
 - (c) (i) In a quadrophonic (4 channel) audio system, signals are sampled at 10kHz and stored as 6 bits values :
 - (a) Calculate the required digital bandwidth
 - (b) What is the highest frequency of the analog signal that can be reproduced from digitized signal.
 - (ii) Explain how compression is achieved using the GIF standard. Is it lossy or lossless?
4. Attempt any **two** parts of the following : **10×2 = 20**
- (a) Discuss the following with suitable diagrams/ examples in context to digital audio :
 - (i) Sampling Rate
 - (ii) Sampling Resolution
 - (iii) Bit Rate
 - (iv) Quantization Error
 - (v) Signal-to-Noise Ratio.

- (b) Discuss in detail the JPEG compression scheme.
- (c) Explain the process of video capturing and digitization.

5. Attempt any **two** parts of the following :- **10×2 = 20**

- (a) What are the various types of frames in MPEG?
How are these frames encoded?
- (b) Why is multimedia presentation standard needed? Explain different classes of MHEG model.
- (c) Describe various phases of multimedia application development.