Printed Pages : 4 MCA502(1)

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

PAPER ID : 1436 Roll No.

M.C.A

(SEM V) ODD SEMESTER THEORY EXAMINATION 2009-10

MULTIMEDIA SYSTEMS

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

Note : *(i) Attempt all questions.*
(ii) Each question carries equal marks.

1 Attempt any **four** parts : 5×4=20

(a) What do you understand by the term multimedia ? Describe how can multimedia be useful in business domain.

(b) Discuss the hardware requirements of multimedia systems.

(c) Determine the rate of the sample in an encoder which is to be used for the digitization of an analog signal which had a bandwidth from 15 Hz through to 10 kHz assuming the digitized signals ;

(i) is to be stored within the memory of a computer

(ii) is to be transmitted over a channel which has a bandwidth from 200 Hz to 3.4 kHz.

(d) Why do we need authoring tools ? Discuss the salient features that are to be considered while purchasing an authoring software.

(e) What are the general guidelines that are useful in designing interactive multimedia ?

(f) Discuss various phases in multimedia application development.

2 Attempt any **four** parts : **5×4=20**

(a) What do you understand by MIDI ? How MIDI files are different from digital audio ?

(b) What are the various audio file formats ? Explain them briefly.

(c) Calculate the size of 1 minute, 44.1 kHz, 16-bits stereophonic sound file.

(d) Discuss the use of text in multimedia. Explain the term hypermedia and hypertext.

(e) What is the amount of memory that is required to store a 256-color image with each of the display sizes :

(i) **1024×768**

(ii) **1280×1024**

(f) Explain any one dictionary based text compression technique.

3 Attempt any **two** parts : **10×2=20**

(a) In context to flash explain the following :

(i) Layers and frames

(ii) Tweening of the shapes

(iii) Symbols

(iv) Sound addition to a movie

(b) Assuming the bandwidth of a speech signal is from 50 Hz through to 10 kHz and that of a music signal is from 15 Hz through to 20 kHz. derive the bit rate that is generated by the digitization procedure in each case assuming the Nyquist sampling rate is used with 12 bits per sample for the speech signal and 16 bits per sample for the music signal. Derive the memory required to store a 10 minute passage of stereophonic music.

(c) What is Data Compression ? Why is compression required in multimedia system ? What are the various compression techniques ?

Answer any **two**. parts : **10×2=20**

(a) A series of messages is to be transmitted between two computers over PSTN. The messages comprise just the characters A through H. Analysis has shown that the probability (relative frequency of occurrence) of each character is as follows :

A and B = 0.25, C and D = 0.14

E, F, G and H =0.055

(i) Use Shannon's formula to derive the minimum average number of bits per character.

(ii) Use Huffman coding to derive a code word set and construct the corresponding Huffman code tree.

formation for the text string "WYS*WYGWYS*WYSWYSG".

Attempt any **two** parts : **10×2=20**

(a) Explain different aspects of video signal representation. Explain various frames supported by MPEG standard.

(b) Explain all the steps of JPEG image compression standard.

(c) Discuss MHEG standard.

(iii) Derive the average number of bits per character for your code word set and compare this with 7-bit ASCII code words.

(b) What do you mean by speech compression ? Discuss various techniques of speech compression.

(c) (i) Differentiate between :

(a) Static and dynamic coding

(b) Bitmap and vector drawing images.

(ii) Show all the steps of LZW compression including dictionary formation for the text string "WYS*WYGWYS*WYSWYSG".

5 Attempt any **two** parts : 10×

(a) Explain different aspects of video signal representation. Explain various frames supported by MPEG standard.

(b) Explain all the steps of JPEG image compression standard.

(c) Discuss MHEG standard.
