



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech[EEE, EE(O)EIE(O)]/SEM-7/IT-711/2009-10

2009

MULTIMEDIA SYSTEMS

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives of the following : $10 \times 1 = 10$

i) Colour principle is based on

- a) additive and subtractive colour mixing
- b) image resolution
- c) image quality
- d) none of these.

ii) BMP format uses which of the following algorithms ?

- a) Huffman
- b) Run length encoding
- c) Neither (a) nor (b)
- d) Both (a) and (b).



iii) MP3 is in which of the following MPEG standards ?

- a) MPEG 1 b) MPEG 2
- c) MPEG 3 d) MPEG 4.

iv) The process of recording a sound, stored in the form of thousands of individual measurements each at a discrete point of time is called

- a) sampling b) synthesizing
- c) quantizing d) streaming.

v) Audio recorded at 44.1 kHz, 16 bit stereo is considered

- a) phone quality b) voice quality
- c) FM quality d) CD quality.

vi) The video standard used in India is

- a) NTSC b) PAL
- c) SECAM d) BHABA-256.

vii) What does HSI colour model stand for ?

- a) Hologram saturated integration
- b) Hue saturation intensity
- c) Huffman smoothing integration
- d) None of these.



viii) Brightness represents

- a) amount of energy that stimulates the eye
- b) the actual colour of the source
- c) the strength of the colour
- d) the actual colour of the destination.

ix) In the non-interlaced mode the scanning process has

- a) one pass
- b) two pass
- c) three pass
- d) four pass.

x) Spatial domain shows

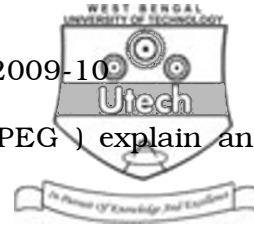
- a) how quickly the amplitude of the colour is changing from one pixel to the next in an image file
- b) the amplitude of the colour as we move through space.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What do you mean by animation ? Briefly explain.
3. Compare and contrast vector and raster scan methods.



4. With reference to video compression (MPEG) explain any one of the following :

- a) I frame
- b) P frame
- c) B frame.

5. What is multimedia ? Illustrate the basic features of different media. 2 + 3

6. Explain synthesized audio with suitable diagram.

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Define sound sampling rate, sampling size and quantization.
- b) What is morphing ? What is the difference between morphing and shape tweening ?
- c) Compare and contrast different MPEG standards.

(3 × 2) + (2 × 2) + 5

8. a) What are hypertext and hypermedia ? What is the relation between multimedia, hypertext and hypermedia ?



b) How would you classify different types of media ? Give one example for each.

c) Comment on 'multimedia database'. (2 + 5) + 5 + 3

9. a) Explain the run length encoding method.

b) A series of messages is to be transferred between two computers over a PSTN. The message comprises the character from 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 = H = 0.0555

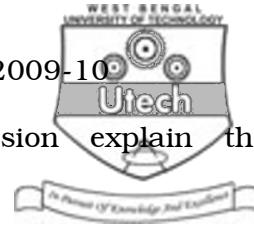
i) Use Huffman coding to derive a code word set.

ii) Derive the average no. of bits per character for your code word set and compare this with

x) fixed length binary code word.

y) bit ASCII code word. 5 + (5 + 5)

10. a) An audio clip has duration of 4 minutes. The frequency of sound wave is 22050 Hz. This is to be sampled using 8 bits. Calculate the file size in stereo and mono mode.



- b) With reference to video compression explain the following terms :

- i) spatial redundancy and temporal redundancy
- ii) interframe coding and intraframe coding.

5 + (5 + 5)

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

$A = 0.10$, $B = 0.25$, $C = 0.05$, $D = 0.32$, $E = 0.01$,
 $F = 0.07$, $G = 0.2$.

Use Huffman coding to derive a suitable code word.

- b) Define entropy.
- c) Four different characters A, B, C, D each of which occurs with a relative frequency of occurrence 0.125, 0.125, 0.5, 0.25 respectively. The encoding algorithm under consideration uses the following code word :

$A = 010$, $B = 011$, $C = 10$, $D = 11$

- i) Compute average number of bits per code word.

- ii) The entropy of the source.

7 + 3 + 5



12. Write short notes on any *four* of the following :

- a) Arithmetic coding
- b) Virtual reality
- c) Multimedia database
- d) MIDI
- e) CCD
- f) ISDN and ATM.

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