MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : IT-702

PUID : 07043 (To be mentioned in the main answer script)

MULTIMEDIA

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 for the following : $10 \times 1 = 10$

i) MP3 is in which of the following MPEG Standards ?

a) MPEG1 b) MPEG2

c) MPEG3 d) MPEG21

ii) The MIDI standard specifies how many channels ?

a) 16 b) 24

c) 32 d) 40.

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iii) CD ROM operates on

a) 1 mode b) 2 mode

c) 3 mode d) 4 mode.

iv) Rich text is known as

a) Un-formatted text b) Formatted text

c) Hypertext d) None of these.

v) Two parts of Morphing algorithms are

a) Wrap and tweening

b) Tweening and wrap

c) Wrap and dissolve

d) Tweening and dissolve.

vi) Huffman Encoding is a ..... encoding techniques.

a) Suffix b) Prefix

c) Both (a) and (b) d) None of these.

vii) Resolution of VGA monitor is (in pixel)

a) 640 × 480 b) 800 × 600

c) 320 × 440 d) 1024 × 768.

viii) MPEG stands for

a) Motion Picture Express Group

b) Motion Picture Expert Group

c) Motion Picture Export Group

d) None of these.

ix) BMP format uses which of the following algorithms ?

a) Huffman

b) Run Length Algorithm

c) Neither (a) nor (b)

d) both (a) and (b).

x) In Gray scale colour mode, we get ..... numbers of different colours.

a) 2^{24} b) 2^{8}

c) 2^{16} d) 2^{2}.

GROUP – B

(Short Answer Type Questions)

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

2. Explain the criterion for sampling. Hence calculate the file size for 40 minutes audio clips with frequency 40 kHz and 6 bit sampling resolution for telephone quality sound and CD quality sound.

3. A series of messages is to be transferred between two computers. The message comprises five characters, and the analysis has been done with the probability (relative frequency of occurrence) of each character as : P = 0·55; Q = 0·27; R = 0·17; S = 0·26; T = 0·25. Using Huffman coding, derive the Huffman tree and also calculate the codeword set.

4. Explain the concepts of Quad tree and hence give the procedural steps for insertion of elements in a quad tree with the help of an example.

5. Explain the term Animation. Discuss its various types and hence explain keyword and tweening with the help of diagram.

6. Discuss thoroughly the display system technique and raster scan method.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Explain the terms 'Sampling rate', 'Sampling resolution' and 'Quantization error' related to the digitization of analog sound signal with suitable diagrams.

b) An analog 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 and (ii) bits.

c) Explain the advantages and disadvantages of MIDI over digital audio.

d) What are the different stages associated with JPEG (base line mode) compression ? Explain image block preparation stage of JPEG compression.

5 + 3 + 3 + (2 + 2)

8. a) What do you mean by CCD ? Why is it used ?

b) How would you distinguish different types of Media ? Explain with examples.

c) What is CAV and CLV in case of spinning disk media ?

d) A magnetic disk pack has 12 surfaces out of which 8 are recordable. Each surface has 50 tracks and each track is divided into a number of sectors. If the total capacity of the disk pack is 50 MB and the capacity of each sector is 512 bytes, then

i) how many cylinders are present in the disk pack ?

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ii) how many sectors are present on each track ?

3 + 5 + 3 + (2 + 2)

9. a) Explain the terms luminance, hue and saturation used to specify the colour characteristics of an image.

b) Describe briefly RGB colour model. How is it related to CMY [K] colour model ? What is the value of K ?

c) What do you mean by CODEC ? What is the difference between intraframe and interframe compression ?

3 + (2 + 2 + 2) + (2 + 4)

10. a) What is Multimedia Database ? Describe in brief how image database is constructed.

b) What is kD Tree ? Explain the structure of 2 dimension kD Tree by using the following points :

[(6, 1), (5, 5), (9, 6), (3, 6), (4, 9), (4, 0), (7, 9), (2, 9)]

c) What do you mean by I-frame, B-frame and P-frame in the context of video compression ?

(2 + 3) + (1 +5) + 4

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11. Write short notes on any *three* of the following : 3 × 5

a) SGML

b) ODA

c) MHEG

d) CMY Colour Model

e) Morphing and Masking.