2023

COMPUTER SCIENCE — HONOURS

Paper : DSE-A-4

(Multimedia and its Applications)

Full Marks : 50

The figures in the margin indicate full marks.

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

Answer **question no.** 1 and **any four** from the rest.

1. Answer **any five** questions :   2×5

   (a) What is Multimedia?

   (b) Name any two QoS parameters.

   (c) What are chroma keys?

   (d) What is JPEG?

   (e) Define Rasterization.

   (f) An analog sound signal of frequency F is digitized using a bit-depth of 20 in stereo mode. If the resulting file has the same data rate as an audio CD, find the value of F.

   (g) A 15 inch monitor with aspect ratio 4 : 3, has pixel addressability of 800×600. Calculate its resolution and dot pitch.

   (h) What is 3D modelling?

2. (a) Briefly explain how Bitmap images can be converted to vector drawn images.

   (b) A monitor of aspect ratio 4 : 3 with 900 dots along a vertical column needs to display images with 32768 colours. Calculate the minimum amount of display memory required in MB. Also calculate the monitor resolution in dpi for a 20 inch monitor.   5+5

3. (a) Discuss three implications of using digital video in multimedia.

   (b) Describe the creation of digital video.   3+7

4. (a) Compare between bitmaps and vector drawn objects.

   (b) An audio clip has a duration of 8 minutes. The highest frequency in the sound wave is 15 kHz. This is to be sampled using 8 bits per sample and in stereo mode. Estimate the minimum data rate in KB/sec required to playback the digital file and the file size in MB.   7+3

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5. (a) Briefly describe the Audio File Formats used in Multimedia.

   (b) A GIF image occupies a rectangular area of A inch by B inch on a monitor screen. The resolution of the monitor is C dpi. Calculate file size of the image in KB. 5+5

6. (a) Why do we use dithering in Multimedia?

   (b) Explain with proper examples why we use additive and subtractive colour models.

   (c) A monitor has pixel addressability of 800×600 and a colour depth of 24 bits. Calculate the minimum amount of display memory required on its adapter card. 4+4+2

7. (a) What is trans-coding?

   (b) Differentiate between the static and dynamic trans-coding.

   (c) Discuss the principles of Animation. 1+5+4

8. (a) Name a suitable lossless data compression technique used in text compression and explain it briefly with a suitable example.

   (b) What is meant by delivering of Multimedia? 8+2

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