No. of Printed Pages : **4**

Sl. No.

C6-R4 : MULTIMEDIA SYSTEMS

DURATION : 03 Hours **MAXIMUM MARKS : 100**

Roll No. : | | | | | | |

Answer Sheet No. : | | | | | | |

Name of Candidate : _____ **; Signature of Candidate :** _____

INSTRUCTIONS FOR CANDIDATES :

- Carefully read the instructions given on Question Paper, Answer Sheet.
- Question Paper is in English language. Candidate has to answer in English Language only.
- **Question paper contains Seven questions. The Question No. 1 is compulsory. Attempt any FOUR Questions from Question No. 2 to 7.**
- **Parts of the same question should be answered together and in the same sequence.**
- **Questions are** to be answered in the **ANSWER SHEET** only, supplied with the Question Paper.
- **Candidate cannot leave the examination hall/ room without signing on the attendance sheet and handing over his/her Answer Sheet to the Invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**
- After receiving the instruction to open the booklet and before answering the questions, the candidate should ensure that the Question Booklet is complete in all respects.

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

1. (a) What is the role of scripts in multimedia presentations ?

(b) Compare hypertext and hypermedia using specific examples.

(c) Distinguish between speech and general audio compression. Mention techniques used for each and their key applications.

(d) List and explain the main characteristics of the MMX instruction set.

(e) What is Quality of Service (QoS) in multimedia networking ? Why is it important ?

(f) List and explain any four key SMIL elements.

(g) What is velocity in a MIDI message and how does it affect sound ?

(7x4)

2. (a) What are raster and vector graphics ? Give examples.

(b) Explain the role of frame rate in video playback.

(c) What are the common challenges in synchronizing video with audio ?

(d) Discuss user-triggered vs system-triggered events with examples.

(6+4+4+4)

3. (a) Describe the video compression schemes of MPEG-1 and MPEG-2. Emphasize the distinctions and working principles between them.

(b) Describe the JPEG still image compression method. Explain its key steps such as DCT, quantization, and entropy coding.

(c) Explain how speech compression is used in telecommunication systems. Name and describe at least two speech codecs.

(6+6+6)

4. (a) Examine the functions of the Central Processing Unit (CPU), Graphics Processing Unit (GPU), memory, and storage in multimedia workstations.

(b) How does a file system manage large multimedia files efficiently ?

(c) Discuss how Direct Memory Access (DMA) improves the efficiency of multimedia data transfer.

(d) Explain the architectural requirements of a multimedia PC for supporting high quality video and audio playback.

(6+4+4+4)

5. (a) Briefly discuss the structure of an RTP packet and its key components. How does RTP ensure the timely delivery of audio/video streams ?

(b) Explain the working of RSVP in setting up a QoS path between the sender and receiver. How do routers handle RSVP messages in a network with multiple paths ?

(c) What are the major components of a video conferencing system ? Compare circuit-switched and packet-switched networks for video conferencing.

(6+6+6)

6. (a) Discuss the indexing methods used in multimedia databases for efficient retrieval.

(b) What are the challenges in implementing a robust image retrieval system ?

(c) Explain the concept of shot boundary detection in video retrieval.

(d) What are the network and storage requirements for Video on Demand system design ?

(4+5+4+5)

7. (a) Define the term "teleoperation" and explain its applications in virtual reality systems.

(b) What is a data glove? How does it provide input to a virtual environment ?

(c) Compare auto-stereoscopic displays and holographic displays in virtual reality.

(d) Discuss the role of VRML in creating virtual environments.

(4+4+4+6)

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SPACE FOR ROUGH WORK