(T) Roll No. .....

PAPER ID—11682

B.Tech. EXAMINATION, 2025

(Seventh Semester)

COMPUTER SCIENCE AND ENGINEERING

Multimedia Technologies

Time : 3 Hours *Maximum Marks : 70*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) Define communication technology and mention any *one* multimedia communication device.

   (b) Why is anti-aliasing needed in digital graphics ?

   (c) What is image capturing ? Name one device used for image capture.

   (d) Differentiate between a system palette and an application palette.

   (e) Mention two methods used to encode analog audio signals.

   (f) Name any *two* video compression techniques.

   (g) Mention any *two* applications of virtual reality in healthcare. **7×2=14**

Unit I

2. (a) Describe the multimedia system architecture. Explain the roles of CPU, storage devices, operating system, and I/O devices in a multimedia framework. 7

   (b) Discuss, how LANs support multimedia applications. Explain bandwidth requirements, protocols and challenges in multimedia transmission. 7

3. (a) Explain different animation techniques such as computer-generated animation, cel animation and path animation. Give suitable examples. 7

(b) What is a multimedia server ? Explain its components and functionalities. Discuss, how multimedia databases manage different media types. 7

Unit II

4. (a) Explain RGB, CMYK and HSV color models. Compare them based on structure, use cases and advantages. 7

(b) Discuss the objectives of JPEG compression. Explain the overall architecture of JPEG encoder and decoder with a neat block diagram. 7

5. (a) Compare GIF, TIFF, BMP and PNG formats based on their compression methods, supported color depths, transparency features and use cases. 7

(b) What is lossless JPEG compression ? Explain predictive lossless coding technique and discuss situations where lossless JPEG is preferred. 7

Unit III

6. (a) Elaborate the various methods of encoding analog signals such as PCM, DPCM and Delta Modulation. Compare their characteristics. 7

(b) Describe the basic principles of speech recognition and text-to-speech generation. Discuss their applications. 7

7. (a) Explain digital video compression techniques. Discuss spatial and temporal compression with examples. 7

(b) What is DVI technology ? Explain its features, working and role in delivering realtime multimedia content. 7

Unit IV

8. (a) Define desktop virtual reality. Describe its features, advantages, limitations and applications in various multimedia systems. 7

(b) Explain the functions of a VR operating system. Discuss, how it manages rendering, user interaction, and device communication in a VR environment ? 7

9. (a) Elaborate the role of intelligent VR software systems. Discuss AI integration, useradaptive environments and real-time simulation techniques. 7

(b) Discuss, how VR hardware (HMDs, sensors, controllers) and software work together to create immersive virtual environments. 7

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