



Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025
Computer Graphics and Fundamentals of Image Processing

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is Computer Graphics? Explain the applications of computer graphics. (10 Marks)
- b. Develop the code of the Bresenham's line drawing algorithm for $m < 1.0$. Also digitize a line (20, 10) and (30, 18). (10 Marks)

OR

- 2 a. Explain Raster scan and Random scan display system. (10 Marks)
- b. Explain OpenGL point functions, line functions and line attribute functions with examples. (10 Marks)

Module-2

- 3 a. Explain 2 Dimensional shear and reflection transformations. (08 Marks)
- b. Show that two successive translations and also two successive rotations are additive. (08 Marks)
- c. Rotate a polygon which has a co-ordinate positions (1, 1) (3, 1) and (2, 3) by 90° (Counter clockwise) about a fixed (2, 2). Determine co-ordinates after rotation. Draw original and rotated polygon. (04 Marks)

OR

- 4 a. With the help of suitable diagram show the basic 3D geometric transformation techniques and give the transformation matrix. (10 Marks)
- b. Explain OpenGL Raster transformations and OpenGL geometric transformation functions. (10 Marks)

Module-3

- 5 a. Explain the following :
 i) Logical input devices
 ii) Input modes. (10 Marks)
- b. Explain the interactive picture construction techniques with neat diagram. (10 Marks)

OR

- 6 a. Explain development stages for designing of animation sequence. (08 Marks)
- b. Write a note on motion specification. (06 Marks)
- c. Explain OpenGL menu functions. (06 Marks)

Module-4

- 7 a. Define image processing and describe its related fields. (07 Marks)
- b. Explain the 2D geometrical operations used in image processing. (13 Marks)

OR

- 8 a. Explain the types of images based on different criteria. (12 Marks)
b. Explain the arithmetic operation on an image. (08 Marks)

Module-5

- 9 a. Define image segmentation. Explain the classification of the image segmentation algorithms. (10 Marks)
b. Explain the Roberts, Prewitt and Sobel Edge detection operators and write the generic gradient based algorithm. (10 Marks)

OR

- 10 a. Define Edge. Explain the stages in edge detection. (10 Marks)
b. Derive the equation for Laplacian of Gaussian operator and difference of Gaussian filter. (10 Marks)

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