

No. of Printed Pages : 4

Sl. No.

B2.4-R5 : COMPUTER GRAPHICS AND MULTIMEDIA

DURATION : 03 Hours

MAXIMUM MARKS : 100

Roll No. :

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Answer Sheet No. :

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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.

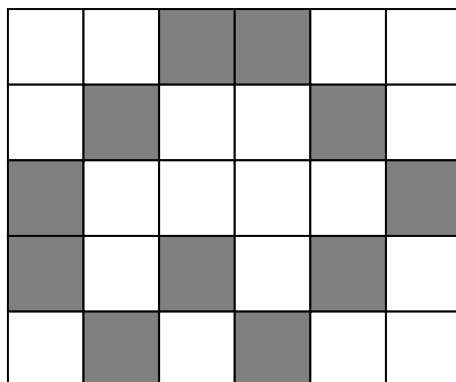
DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

1. (a) Explain vertical retrace and horizontal retrace.
 (b) What are the functions of passive and active graphics devices. ? Explain in detail.
 (c) How can you determine the resolution and aspect ratio of the screen P pixels in x - direction & Q Pixels in y -direction ?
 (d) How can you determine whether the polygon is convex or concave ? Explain with an example.
 (e) Explain 4-connected and 8-connected region.
 (f) What are the different components of Computer Graphics ?
 (g) Enlist the differences between Joystick and Trackball. (7×4)

2. (a) Compute the size of the frame buffer(byte) to store 8 bit per pixel, where the size of the screen is 17×17 inches with a resolution 80 pixels per square inch.
 (b) How do you change the shape of an object without using shearing transformation ?
 (c) Generate the pixel point of a line from (1, 1) to (8, 5) using Bresenham's algorithm. (6+6+6)

3. (a) Write down the configuration of Plasma Panel Display.
 (b) Find the transformed triangle having vertices at A(0, 0), B(5, 1) C(3, 4) rotated by 90° about a fixed point(2, 3).
 (c) Describe the utility of homogeneous coordinate system in transformation. (6+6+6)

4. (a) Prove that a midpoint of straight line PQ [(0, 2), (3, 2)] after transformation $\begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}$ will be the same midpoint of the transform straight line P'Q'.
 (b) Explain and derive the transformation matrix for orthographic projection.
 (c) Enumerate the pixel and fill the area of boundary defined region of the following image using the Boundary fill algorithm.



(6+6+6)

5. (a) A clipping window ABCD having size (4, 4) has the upper right corner at (11, 9), Assign the region code for the line MN and PQ using Cohen Sutherland Line clipping algorithm. The coordinates of M, N, P & Q are (1, 12), (10, 1), (1, 4) & (5, 7) respectively.
- (b) Describe the different classes of the perspective drawing.
- (c) Find the new coordinate of a transformed 3-D cube by rotating it by 45° from origin. The coordinates of a cube are A, B, C, D, E, F, G & H and (2, 1, 2), (3, 1, 2), (3, 1, 1), (2, 1, 1), (2, 2, 2), (3, 2, 2), (3, 2, 1) & (2, 2, 1) respectively. **(6+6+6)**
6. (a) Explain in detail the utility of different orders of Continuity of curves for generation of curves.
- (b) Determine the five points on a bezier curve with equidistant parametric values, having control points $(x_0, y_0) = (20, 30)$, $(x_1, y_1) = (40, 70)$, $(x_2, y_2) = (80, 70)$, $(x_3, y_3) = (40, 100)$ distributed over a screen.
- (c) For a standard perspective projection with vanishing point at $(0, 0, -d)$, what is the projected image of a line segment joining $P(-1, 1, -2d)$ and $Q(2, -2, 0)$? **(6+6+6)**
7. (a) In an MPEG Encoding, I, B & P frames are used. Explain.
- (b) Describe in brief Z-Flat Shading Model.
- (c) What are the different Audio file formats used? Explain them. **(6+6+6)**

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SPACE FOR ROUGH WORK