



- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Illustrate your answers whenever necessary with the help of neat sketches.
 9. Use of non programmable calculator is permitted.
 10. Use graph paper wherever necessary.

1. a) Compare and contrast the direct view storage tube and calligraphic refresh display. **7**
- b) Explain graphics pipeline in detail. **6**

OR

2. a) Explain video controller in detail. **5**
- b) Write short note on. **8**
- i) Shadow mask CRT
 - ii) Hardcopy Technology.
3. a) Explain Edge flag algorithm with an example. **6**
- b) Fill the polygon defined by Vertices. **7**
- $P_1(1,1), P_2(3,3), P_3(5,3), P_4(7,1), P_5(7,7), P_6(5,5), P_7(3,5)$ and $P_8(1,7)$ using simple ordered edge list algorithm.

OR

4. a) Explain seed fill algorithm in detail. **5**
- b) Explain following with diagram. **8**
- i) Halftoning.
 - ii) Aliasing and antialiasing.
5. a) What is OpenGL Algo? Explain its features and role in computer graphics. **6**
- b) Write a short note on.
- i) GL **3**
 - ii) GLU **3**
 - iii) GLUT **2**

OR

6. a) Write a program to draw a line in OpenGL. 7
b) List all the graphics Libraries available in OPENGL. 4
c) Explain 3D Transformation in OPENGL. 3
7. a) Write a short note on. 6
i) Multiple Windowing.
ii) Generalised Clipping.
b) Explain Sutherland when algorithm in detail. 7

OR

8. a) What is the need of transformation? Explain various transformation techniques. 6
b) Find the reflection of diamond shaped polygon whose vertices. are A (-1,0) B(0,2), C(1,0) and D (0,2) about line $Y=X+2$. 7
9. a) Find the normalization transformation 'N' which user the rectangle defined as $V_1(1,1)$, $V_2(5,3)$, $V_3(4,5)$ and $V_4(0,3)$ as a window & the normalized device screen as a viewport 7
b) Explain parallel and perspective projection in detail. 6

OR

10. a) Explain various algorithm for hidden surface removal with their advantages and disadvantages. 7
b) Explain 3D transformation in detail. 6
11. a) Construct the Bezier curve of order 3 and with 4 polygon vertices A (1,1), B (2,3) C (4,3) and D (6,4). 6
b) What is need of Basic Ray tracing and write an algorithm of basic Ray tracing algorithm. 8

OR

12. a) Explain different types of shading. 5
b) Explain blending function for the four sample points? 5
c) Explain I del Specular reflection. 4
