

B.TECH. SEM -IV (COMPUTER) 2014 COURSE (CBCS) :
WINTER - 2017

SUBJECT: COMPUTER GRAPHICS AND VISUALIZATION

Day : **Tuesday**
Date : **21/11/2017**

W-2017-2074

Time **02.30 PM TO 05.30 PM**
Max.Marks:60

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of Non-programmable **CALCULATOR** is allowed.
- 4) Assume suitable data if necessary.

- Q.1** a) Which algorithms is best suitable for circle drawing? Justify your answer. (05)
b) Compare raster scan and random scan display. (05)

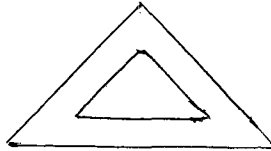
OR

- a) Define display file and illustrate importance of display file in vector scan display. (05)
- b) Raster a line from A (3, 2) to B (7, 9) using DDA line drawing algorithm. (05)

- Q.2** a) Why flood fill algorithm fails to fill large polygon? What could be done to avoid this? (05)
b) Design a procedure for filling the interior of any specified set of polygon using the non-zero winding number to identify interior region. (05)

OR

- a) Explain the Cohen-Sutherland technique for line clipping. (05)
- b) Discuss scan conversion algorithms. How it will work for following figure. (05)



- Q.3** a) Derive a 3 D transformation matrix for rotation about an arbitrary axis. (05)
b) Find out final co-ordinates of a figure bounded by (1, 1) (3, 4) (5, 7) (10, 3) when rotated about the point (8, 8) by 30° in clockwise direction. (05)

OR

- a) Find out final co-ordinates of triangle bounded by the coordinates (0, 2, 1) (2, 3, 0) and (1, 2, 1) by 60° in anticlockwise direction and scaled by 2 units in X-direction, 3 units in Y-direction, 2 unit in Z- direction. (05)
- b) Write a short note on of parallel and perspective projection. (05)

- Q.4** What is ray tracing algorithm for hidden surface removal? Explain mathematically how do we find which planes are visible using ray tracing algorithm. (10)

OR

- a) Derive simple illumination model include the contribution of diffuse, ambient and specular reflection. (05)
- b) Differentiate between RGB and CMY color model. (05)

- Q.5** What is a segment table? How do be cerate it? Why do we need segments? Enlist all the characteristics of segments. (10)

OR

- a) Explain following term in detail: (05)
 - i) Virtual Reality
 - ii) Morphing
- b) How animation is created by computer? Explain various methods used to control animation. (05)

- Q.6** Given control points (10,100), (50,100), (70,120) and (100,150). Calculate co-ordinates of any four points lying on the corresponding Bezier curve. (10)

OR

- a) How periodic B-spline curves are different from non-periodic B-spline curves? (05)
- b) How curves are generated by true curve generation method as well as approximation method? Explain in detail (05)