B.TECH. SEM -IV (COMPUTER) 2014 COURSE (CBCS) : SUMMER - 2018

SUBJECT: COMPUTER GRAPHICS AND VISUALIZATION

Day : **Tuesday** Time **10.00 AM TO 01.00 PM**

Date : **05/06/2018** **S-2018-2282** 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)** Raster a line from (3, 2) to B (7, 9) using Bresenham's line drawing algorithm. **(05)**

b) Describe the function of display processor in raster scan and vector scan display. **(05)**

OR

a) How Bresenham's circle drawing technique is advantageous? **(05)**

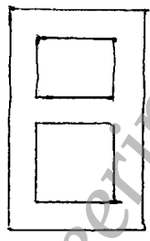
b) Raster a line from A (-6,-6) to B (0, 0) using DDA line drawing algorithms. **(05)**

Q.2 **a)** Identify drawbacks of boundary fill algorithm and flood fill algorithm. How scan line algorithm overcomes it? **(05)**

b) Explain the Sutherland-Hodgeman technique for polygon clipping **(05)**

OR

a) Write a short note on scan conversion algorithm. How it will work for following figure. **(05)**



b) Design a procedure for filling the interior of any specified set of polygon vertices using the non-zero winding number to identify interior region. **(05)**

Q.3 **a)** Find out final coordinates of triangle bounded by the coordinates (0, 2, 1), (2, 3, 0), (1, 2, 1) by 60^0 in anticlockwise direction and scaled by 2 units ix X-direction, 3 units in Y-direction, 2 unit in Z direction. **(05)**

b) Examine need of homogeneous coordinates system. Give the homogeneous coordinates for translation, rotation and scaling in 2 D transformation. **(05)**

OR

a) Derive a 2 D transformation matrix for rotation about arbitrary point. **(05)**

b) Prove that transformation matrix for the reflection about the line Y=X is equivalent to reflection about to X-axis followed by counter clockwise rotation by 90^0 **(05)**

Q.4 What is hidden surface removal method? Why do we need to remove hidden surface? Discuss the Z- buffer algorithm for hidden surface removal. **(10)**

OR

a) Explain Phong shading model in detail **(05)**

b) With neat diagram explain HSV color model. **(05)**

Q.5 Explain following operations performed on segments **(10)**

i) Segment creation iii) Closing a segment

ii) Deleting a segment iv) Renaming segment

OR

a) What are different languages and tools are used to generate animation? Explain in detail. **(05)**

b) Explain Virtual Reality concept in detail. **(05)**

Q.6 What are different properties of Bezier curve? How to generate Bezier curve using four control points? Explain with example. **(10)**

OR

a) What are different types of fractals? Explain with examples. **(05)**

b) How interpolation method is used to generate curves? **(05)**

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