B.TECH. SEM -V MECHANICAL 2014 COURSE (CBCS) : SUMMER - 2018

SUBJECT : ADVANCED COMPUTER GRAPHICS AND SOLID MODELLING

Day : **Wednesday** | **S-2018-2367** | Time : **10.00 AM TO 01.00 PM**
Date : **23/05/2018** | 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) Draw neat and labelled diagram **WHEREVER** necessary.
5) Assume suitable data, if necessary.

Q. 1 Derive the relation for pixel location using Bresenham line drawing algorithm. **(10)**

OR

Locate the pixel positions in first quadrant of circle having radius 10 units and center at origin. **(10)**

Q. 2 A triangle PQR with vertices P (2, 2), Q (5, 2) and R (4, 7) is to be reflected about line $y = 0.5x + 3$. **(10)**
Determine : i) the concatenated transformation matrix
ii) co-ordinates of the vertices for reflected triangle

OR

Derive 2 D transformation matrix for translation, rotation and scaling. **(10)**

Q. 3 A tetrahedron is defined by following points A (2, 3, 4) B (6, 3,4) C (2, 5, 4) and D (4, 4, 10). Obtain transformation matrix to generate data for orthographic view of the object in viewing plane and co-ordinates of vertices in viewing plane. **(10)**

OR

Derive the matrix for transformation for orthographic projections. **(10)**

Q. 4 A line is represented by end points P (5, 7, 2) and Q (-4, 6, 3). If u at P and Q is 0 and 1 respectively determine its length. Also determine the co-ordinates of point represented by $u = 0.4$, $u = 0.25$ and $u = 1.5$. **(10)**

OR

What are advantages of parametric representation of curves in CAD system? **(10)**

Q. 5 Explain prametric representation of analytic surfaces. **(10)**

OR

A line segment with end point P (0, 0) and Q (10, 5) lying in xy plane i.e. $z = 0$. Rotate a line about x-axis. Which surface can be generated? Find the point on the surface at $u = 0.5$ and $Q = \pi/2$. **(10)**

Q. 6 Explain IGES architecture. **(10)**

OR

Explain feature based modeling using suitable examples. **(10)**

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