

**B.TECH. SEM -V MECHANICAL 2014 COURSE (CBCS) : WINTER -
2017**

SUBJECT : ADVANCED COMPUTER GRAPHICS AND SOLID MODELLING

Day : **Tuesday**

Time : **02.30 PM TO 05.30 PM**

Date : **16/01/2018**

W-2017-2159

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 mid-point circle algorithm. **(10)**

OR

Using Bresenham algorithm find out which pixels would be turned on for the line with end points (1,2) & (4, 8). **(10)**

Q. 2 A triangle PQR represented as P (14, 15), Q(66,15) and R (40, 60). It is mirrored about line $y = 30$. Determine the new co-ordinates of the triangle. **(10)**

OR

Derive transformation matrix for rotation about arbitrary point. **(10)**

Q. 3 A triangle is defined by the vertices A (1, 2, 4), B (4, 3, 5) and C (5, 8, 3). The three orthographic view are to be projected, write transformation matrix and hence determine the co-ordinates of front, top and right hand side view. **(10)**

OR

Derive the matrix when point P (x, y, z) is rotated about x, y, z axis and axis parallel to x, y and z. **(10)**

Q. 4 What is the need of using synthetic (free) curves in CAD software? **(10)**

OR

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). **(10)**

Q. 5 Define Bezier surface. Explain various characteristics of this surface. **(10)**

OR

Generate cylindrical tabulated surface by translating original centered unit radius circle, in XY plane along Z-axis 5unit long and give parametric equation. **(10)**

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

OR

Explain following with reference to solid modeling: **(10)**

- a) CSG
- b) B.Rep

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