Total No. of Questions—**8**] [Total No. of Printed Pages—**3**

| Seat No. | |
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# [4857]-1086

## S.E. (Information Technology) (Second Semester)

## EXAMINATION, 2015

## COMPUTER GRAPHICS

## (2012 PATTERN)

**Time : Two Hours** **Maximum Marks : 50**

***N.B.*** **:—** (*i*) Solve Q. No. **1** *or* Q. No. **2**, Q. No. **3** *or* Q. No. **4**, Q. No. **5** *or* Q. No. **6,** and Q. No. **7** *or* Q. No. **8**.

(*ii*) Neat diagrams must be drawn wherever necessary.

(*iii*) Figures to the right indicate full marks.

(*iv*) Use of calculator is allowed.

(*v*) Assume suitable data, if necessary.

**1.** (*a*) List the methods for character generation. Explain any *two* character generation methods briefly. [6]

(*b*) Derive the equation for decision parameter of midpoint circle algorithm. [6]

*Or*

**2.** (*a*) Explain Scan-Line Polygon filling algorithm. [6]

(*b*) Write matrix representation for the following 3D transformations : [6]

(*i*) Reflection about XY-plane

(*ii*) Rotation about X-axis

(*iii*) Translation in X, Y and Z-directions

(*iv*) Scaling.

P.T.O.

**3.** (*a*) Let ABCD be the rectangular window with A(20, 20), B(90, 20), C(90, 70) and D(20, 70). Find the region codes for endpoints and use Cohen-Sutherland algorithm to clop the lines $P_1$-$P_2$ with $P_1$(10, 30) and $P_2$(80, 90) and $Q_1$-$Q_2$ with $Q_1$(10, 10) and $Q_2$(70, 60). [6]

(*b*) Explain ways of projecting 3D objects onto 2D screen in detail. [6]

*Or*

**4.** (*a*) Explain display file structure. Why is display file interpreter used ? Which are the commands used in display file interpreter ? [6]

(*b*) Explain the different types of polygons. Also explain the various methods for testing a pixel inside a polygon. [6]

**5.** (*a*) Explain HSV color model and also compare it with RGB color model. [6]

(*b*) Explain Gourand shading and Phong Shading methods. [7]

*Or*

**6.** (*a*) What is Animation ? Explain the basic rules required for Animation. [6]

(*b*) How is Polygon shading different from polygon filling ? Explain Phong shading briefly. [7]

**7.** (*a*) Explain the technique of smoothing of curves using B-Spline. [6]

(*b*) Give the set of equations of Bezier curve. Write the algorithm for drawing a Bezier curve section using four points. [7]

*Or*

**8.** (*a*) Explain features of any graphics tool that you had studied. [6]

(*b*) How are fractals used to generate fractal surfaces ? Give *two* examples of fractal surfaces. [7]