C 41289 (Pages 2) Name.....

Reg. No.....

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, MAY 2013

CS/PTCS 09 605—COMPUTER GRAPHICS

(2009 Admission onwards)

Time : Three Hours Maximum : 70 Marks

Part A

Answer **all** *questions.*

1. List the different input and output devices.
2. Differentiate Random-scan systems and Raster-scan systems.
3. Write the rules to be followed in Weiler-Atherton polygon clipping algorithm for counter clockwise processing of polygon vertices.
4. How can you generate bar chart ?
5. Define parallel projection.

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*

6. Explain the importance of normalized coordinate system in viewing transformation.
7. Derive the transformation matrix of 2D rotation.
8. Prove that the multiplication of three-dimensional transformation matrices for any two successive rotations about any one of the coordinate axe is commutative.
9. Derive the decision parameter for drawing an ellipse using Midpoint ellipse drawing algorithm.
10. Write properties of Beizer Curves.
11. How can you compute the vanishing point in 3D ? Discuss.

(4 × 5 = 20 marks)

Part C

Answer **all** *questions.*

12. (a) Discuss in detail Homogeneous coordinates and matrix representation of transformation. (10 marks)

Or

(b) Explain in detail about parametric representation of a line segment. (10 marks)

Turn over

13. (a) Write a note on the following :—

(i) Windowport and viewport. (5 marks)

(ii) Mid-point subdivision algorithm. (5 marks)

Or

(b) Explain in detail about generation of different charts. (10 marks)

14. (a) Write the algorithm for the Bresenham's Circle drawing. Trace the algorithm for drawing circle with radius = 10 and point (5, 20).

(10 marks)

Or

(b) Illustrate B-spline Curve and Beta spline. (10 marks)

15. (a) Explain in detail general perspective-projection transformations. (10 marks)

Or

(b) Develop a procedure, based on a back-face detection technique, for identifying all the visible face of a convex polyhedron that has different-coloured surfaces. Assume that the object is defined in a right-handed viewing system with the *xy*-plan as the viewing surface.

(10 marks)

[4 × 10 = 40 marks]