Reg. No. : ....

Name : ....

Seventh Semester B.Tech. Degree Examination, October 2014
(2008 Scheme)
08.701 : COMPUTER GRAPHICS (R)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions, **each** question carries **4** marks.

1. Briefly explain four applications of computer graphics.

2. Discuss shadow-mask method for colour graphics. For which type of display system it is commonly used ?

3. Consider a display system using 1-bit per pixel and a resolution of 1024×1024 pixels. What is the size of frame buffer (in bytes) required for the display ?

4. What is homogeneous coordinate system ? What are its advantages ?

5. The end points of a line segment are (10, 10) and (30, 30). Obtain its new end points after 30 degree rotation in counter clockwise direction.

6. Show that the composition of two rotations is additive by concatinating the matrix representations for $R(\theta_1)$ and $R(\theta_2)$ to obtain $R(\theta_1) \cdot R(\theta_2) = R(\theta_1 + \theta_2)$.

7. What are the data structures used to represent a polyhedron in a computer ?

8. Explain different types of parallel projections.

9. Distinguish between one-point perspective projection and two point perspective projection.

10. What do you understand by equilization of gray level ? Give an example having four gray levels for an image represented by 4×4 gray level values.

PART – B

Answer **one full** question from **each** module. **Each** full question carries **20** marks.

Module – 1

11. a) Explain the components of a raster scan display system.

b) Given a circle of radius = 10 using Mid-point circle algorithm, determine positions along the circle octant in the first quadrant from $x = 0$ to $x = y$. The initial value of decision parameter $p_0 = 1 - r = -9$. The initial point is (0, 10). Tabulate k, p_k, (x_{k+1}, y_{k+1}).

OR

12. a) What is meant by scan conversion ?

b) Explain (with figures) Scan line polygon filling algorithm. Discuss the data structures used to make the algorithm more efficient.

Module – 2

13. a) Derive the transformation for reflecting a triangle with respect to a line with given slope and y-intercept.

b) Explain a polygon clipping algorithm.

OR

14. a) Illustrate how shearing transformation can be used to convert a unit square into a parallelogram.

b) Explain Cohen-Sutherland line clipping algorithm.

Module – 3

15. a) Derive transformation for perspective projection.

b) Consider a unit cube whose one vertex situated at origin. Apply the one point perspective projection on the $z = 0$ plane assuming the centre of projection at $z_c = 2$ on the z-axis.

OR

16. a) Write and explain Z-buffer algorithm for hidden surface elimination.

b) Compare Robert's edge detector with Sobel's edge detector.

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