

(Please write your Exam Roll No.)

Exam Roll No.

END TERM EXAMINATION

THIRD SEMESTER [MCA] DECEMBER – 2012

Paper Code: MCA203

Subject: Computer Graphics

Time : 3 Hours

Maximum Marks :60

**Note: Attempt five questions including Q. no. 1 which is compulsory.
Select one question from each unit.**

Q1 Answer the following briefly (2 x 10=20)

- (a) Persistence
- (b) Resolution
- (c) Aspect Ratio
- (d) Interlacing
- (e) Size of a 640 X 480 inch image at 240 pixels per inch.
- (f) Number of Pixels in 1024 X 1024 frame buffer
- (g) Coordinate transformations
- (h) 2D reflection matrix
- (i) Window to Viewport Mapping
- (j) Parallel Projections

UNIT-I

Q2 (a) Write Bresenham's algorithm for scan conversion of a circle. (3)

(b) Draw a circle with radius 10 and center coordinates (25,20) using Bresenham's circle drawing algorithm. (3)

(c) Differentiate between 2D Rotation and 3D Rotation. (4)

Q3 (a) Discuss the concept of Boundary-Fill. How it is different from Flood-Fill. (5)

(b) Define Clipping. How Polygon Clipping is performed with Sutherland-Hodgeman polygon clipping algorithm? Illustrate with suitable example. (5)

UNIT-II

- Q4 What do you understand by Bezier Curves and Surfaces? How these are used and useful? Explain their properties and continuity conditions? **(10)**
- Q5 (a) What do you mean by Projection? Discuss principal vanishing points for the standard perspective transformation. **(5)**
- (b) Differentiate between Orthographic and Oblique Parallel Projections. **(5)**

UNIT-III

- Q6 (a) Prove that any two successive rotations about a given rotation axis is commutative. **(5)**
- (b) Differentiate between Octree and BSP tree method of representing solid objects with suitable example. **(5)**
- Q7 (a) Find the normalization transformation that maps a window with lower left corner at (1, 1) and upper right corner at (3,5) onto a viewport that is the entire normalized device screen. **(5)**
- (b) Solve and write the matrix for reflection about line $Y=X$. **(5)**

UNIT-IV

- Q8 What do you understand by hidden surface removal? Discuss Painters (Depth Sort) algorithm for Hidden-Surface problem. **(10)**
- Q9 What steps are required to shade an object using Phong shading method of polygon rendering? How it overcomes the drawbacks of Gouraud Shading Method? **(10)**