Code No: **R42031** **R10** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, April- 2015

INTERACTIVE COMPUTER GRAPHICS

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
*****

1	a)	Explain the electrostatic deflection of the electron beam in the CRT.	[8]
	b)	Draw and explain the architecture of a simple raster graphics system.	[7]
2	a)	Develop and implement a flood fill algorithm to fill the interior of any specified area.	[10]
	b)	Write a boundary fill procedure to fill an eight connected region.	[5]
3	a)	Describe the two dimensional viewing transformation pipelines.	[8]
	b)	Illustrates the viewing coordinating frames.	[7]
4	a)	Define an efficient polygon representation for a cylinder. Justify your choice of representation.	[10]
	b)	Give a note on B-spline curves and surfaces.	[5]
5	a)	Explain how to simulate reflection from surfaces of different roughness using a reflection map.	[10]
	b)	Briefly explain the specular reflection and the Phong model.	[5]
6	a)	Write the classification of visible surface detection algorithms.	[8]
	b)	Explain the procedure for depth buffer method.	[7]
7		Design a storyboard layout and accompanying key frames for an animation of a single polyhedron.	[15]
8		Explain the following: a) Graphics and Image Editing b) Digital Audio c) Video Editing d)Animation	[15]

Code No: **R42031** **R10** **Set No. 2**

IV B.Tech II Semester Regular/Supplementary Examinations, April- 2015

INTERACTIVE COMPUTER GRAPHICS

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
*****

1 Explain how virtual reality systems can be used in design applications. What are some other applications for virtual reality systems? [15]

2 a) Define points and lines. Describe the Bresenham's line algorithm. [8]

b) Explain the boundary fill and flood fill algorithms. [7]

3 a) Describe the window to view port coordinate transformations. [8]

b) Explain the Cohen-Sutherland line clipping algorithm. [7]

4 a) Write a routine to display a cubic Bezier curves using a subdivision method. [8]

b) Give a note on polygon surface and quadratic surface. [7]

5 a) Draw and explain the rendering pipeline for Z buffer and Gouraud shading. [8]

b) Explain the modeling reflections with parameters n_s with a neat diagram. [7]

6 Discuss how antialiasing methods can be incorporated into the various hidden surface elimination algorithms. [15]

7 a) List and explain the steps for design of animation sequences. [8]

b) Discuss the general computer animation functions. [7]

8 Explain the following:

a) Data Compressions b) Multimedia systems
c) APW d) Hierarchical Metaphor [15]

Code No: **R42031** **R10** **Set No. 3**

IV B.Tech II Semester Regular/Supplementary Examinations, April- 2015

INTERACTIVE COMPUTER GRAPHICS

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
*****

1 a) Draw and explain the random scan systems in detail. [10]
b) Write the applications of Computer Graphics. [5]

2 a) Illustrate the scan line polygon fill algorithm with an example. [8]
b) Explain the interior fill of an elliptical arc with a neat diagram. [7]

3 a) Implement the Cyrus-beck line clipping algorithm. [7]
b) Derive the matrix representations for a workstation transformation. [8]

4 a) List and explain the properties B spline curves in detail. [8]
b) Explain the parametric and geometric continuity conditions. [7]

5 How many different color combinations can be generated using halftone approximations on a two level RGB system with a 3 by 3 pixel grid? [15]

6 a) Explain the depth sorting method and scan line method. [8]
b) Give a note on visible surface detection methods. [7]

7 a) List and explain the multimedia authoring tools in detail. [10]
b) Define multimedia. Explain the applications of multimedia. [5]

8 Explain the following:
a) Morphing
b) Kinematics and Dynamics
c) Goal directed systems
d) Directed motion specification [15]

Code No:**R42031** **R10** **Set No. 4**

IV B.Tech II Semester Regular/Supplementary Examinations, April- 2015

INTERACTIVE COMPUTER GRAPHICS

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
*****

1	a)	Write the advantages and disadvantages of raster scan systems.	[8]
	b)	Explain the graphics monitors and workstations in detail.	[7]
2		Write a program to display a bar graph in any selected screen area. Use the polyline function to draw the bars.	[15]
3	a)	Explain the Sutherland-Hodgeman polygon clipping algorithm	[8]
	b)	Discuss the two dimensional viewing functions with an example.	[7]
4	a)	Develop an algorithm for calculating the normal vector to a Bezier surfaces at the point P (u,v).	[10]
	b)	Give a note on hermit curve.	[5]
5	a)	Define diffuse reflection. Describe the diffuse reflection from a surface.	[8]
	b)	Briefly explain the rendering pipeline for Z buffer and Phong shading	[7]
6	a)	Discuss the binary space – partitioning tree method.	[8]
	b)	Explain the back face detection and depth buffer method.	[7]
7	a)	List and explain the computer animation languages in detail.	[7]
	b)	Write a morphing program to transform a sphere into a specified polyhedron.	[8]
8	a)	Explain the object oriented authoring tools in detail.	[8]
	b)	Describe the icon based authoring tools.	[7]