Code No: RT32032 **R13** SET - 1

III B. Tech II Semester Regular/Supplementary Examinations, April- 2017
INTERACTIVE COMPUTER GRAPHICS
(Mechanical Engineering)

Time: 3 hours Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	Describe the working principle of light pen.	[3M]
	b)	What is composite transformation? Give example.	[4M]
	c)	What is multiple windowing?	[4M]
	d)	What is spline?	[3M]
	e)	Write short notes on Z–buffer.	[4M]
	f)	Explain about the raster animation.	[4M]

PART –B

2	a)	List important characteristics of video display devices.	[4M]
	b)	List the advantages and disadvantages of DVST.	[8M]
	c)	Give the classification of printers.	[4M]
3	a)	Explain about the flood-fill polygon algorithm.	[3M]
	b)	Explain about the mid-point circle generation algorithm.	[8M]
	c)	What is aliasing? Explain different methods of minimizing its effect.	[5M]
4		Explain about different line clipping algorithms with examples.	[16M]
5	a)	What are the requirements of a spline? Construct the Bezier with four control points (1,1), (2,1), (2,2) and (1,2).	[8M]
	b)	Explain about the various methods for specifying spline curve.	[8M]
6	a)	Describe any two methods for hidden line removal techniques.	[8M]
	b)	Explain about different 3D transformations with examples.	[8M]
7	a)	Explain about the key frame system.	[8M]
	b)	Explain about the general animation functions.	[8M]

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Code No: RT32032 **R13** SET - 2

III B. Tech II Semester Regular/Supplementary Examinations, April- 2017
INTERACTIVE COMPUTER GRAPHICS
(Mechanical Engineering)

Time: 3 hours Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	What are the applications of computer graphics? Explain.	[3M]
	b)	What are the merits and demerits of the DDA line drawing algorithm?	[4M]
	c)	What is shading?	[3M]
	d)	Write short note on Hermite curve.	[4M]
	e)	What is object space and image space?	[4M]
	f)	What is raster animation? Explain.	[4M]

PART –B

2	a)	Explain various types of printers.	[4M]
	b)	What is computer graphics? What are the major considerations in the study of Computer Graphics?	[8M]
	c)	Explain the terms resolution and aspect ratio.	[4M]
3	a)	Write the Bresenham's algorithm for drawing lines of slope less than 1. (Assume that $\Delta y > 0$).	[8M]
	b)	What are the requirements of a good line drawing algorithm for raster scan display? Explain the working of a simple Digital Differential Analyzer algorithm for drawing a line on these displays.	[8M]
4	a)	What is window and viewport? Describe the general transformation matrix for the viewing transformation.	[8M]
	b)	Show why the Sutherland-Hodgman clipping algorithm will only works for convex clipping regions.	[8M]
5	a)	Explain the properties of Bezier curve.	[4M]
	b)	Construct the B-spline curve of order 3 and with 4 polygon vertices A(1,1), B(2,3), C(4,3) and D(6,4).	[8M]
	c)	Write a short note on B-spline curve.	[4M]
6	a)	Explain the z-buffer algorithm for hidden surface removal.	[8M]
	b)	Explain the features of the back face detection and removal methods.	[8M]
7	a)	What is animation? Explain the design of animation sequence.	[8M]
	b)	What are the motion specifications for computer animation? Explain.	[8M]

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Code No: RT32032 **R13** SET - 3

III B. Tech II Semester Regular/Supplementary Examinations, April- 2017
INTERACTIVE COMPUTER GRAPHICS
(Mechanical Engineering)

Time: 3 hours Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	Differentiate between passive and interactive computer graphics.	[3M]
	b)	What is frame buffer? How it is implemented?	[4M]
	c)	Differentiate a window from a view port.	[3M]
	d)	Explain about shear and scaling.	[4M]
	e)	What is depth sorting?	[4M]
	f)	How animation is different from the transformation? Explain.	[4M]

PART –B

2	a)	Write short notes on Digitizer, mouse and joy stick.	[4M]
	b)	Explain the working of direct-view storage tubes.	[8M]
	c)	Write a short note on raster scan display.	[4M]
3	a)	Explain the features of DDA algorithm for line generation	[3M]
	b)	Describe the DDA algorithm for line generation.	[8M]
	c)	Briefly explain the necessary modifications in DDA algorithm to draw thick lines.	[5M]
4	a)	What is polygon clipping? Explain about the Cohen Sutherland line clipping algorithm.	[8M]
	b)	Explain about Cyrus-beck line clipping algorithms.	[8M]
5	a)	Describe the shading algorithm.	[8M]
	b)	Explain about different transformations with examples.	[8M]
6	a)	Explain the Z-buffer algorithm for hidden surface removal.	[8M]
	b)	Derive the 3D transformation matrix for rotation about an arbitrary axis.	[8M]
7	a)	Explain about key frame system.	[8M]
	b)	Discuss about computer animation language.	[8M]

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Code No: RT32032 **R13** SET - 4

III B. Tech II Semester Regular/Supplementary Examinations, April- 2017
INTERACTIVE COMPUTER GRAPHICS
(Mechanical Engineering)

Time: 3 hours Maximum Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	Discuss about random scan display.	[3M]
	b)	What are the merits of line drawing?	[4M]
	c)	What do you mean by normalization transformation? Why it is needed?	[3M]
	d)	Differentiate between polygon and quadratic surfaces.	[4M]
	e)	Enumerate the difference between 2-D and 3-D graphics systems.	[4M]
	f)	What are the applications of animation?	[4M]

PART –B

2	a)	What is frame buffer? What is the role of the frame buffer in displays?	[4M]
	b)	Explain about different input devices.	[8M]
	c)	Describe the working principle and applications of Raster scan display device.	[4M]
3	a)	What do you mean by line segment and rasterization?	[3M]
	b)	Explain Bresanham's algorithm for line drawing.	[8M]
	c)	Explain about the applications of 2D and 3D graphics.	[5M]
4	a)	Describe the viewing and windowing transformations.	[8M]
	b)	Describe the Sutherland-Hodgman algorithm for polygon clipping with help of a suitable example.	[8M]
5	a)	What is the utility of a shading model? What are the main considerations in developing a shading model?	[8M]
	b)	Describe the transformation matrix for rotation about an arbitrary axis.	[8M]
6	a)	Explain scan line algorithm.	[8M]
	b)	Show how shear transformations can be expressed in terms of rotations and scales.	[8M]
7		Explain about general computer animation functions with examples.	[16M]

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