GANPAT UNIVERSITY
B. Tech. Semester: V (Information Technology)
Regular Examination November – December 2013
2IT503: Computer Graphics

Time: 3 Hours   Total Marks: 70

Instruction 1. Figures to the right indicate full marks
2. Each section should be written in a separate answer book
3. Be precise and to the point in your answer

Section – I

Que. – 1			12
	A	Explain loading of frame buffer in detail. If (Xmin, Ymin) = (0, 0) and (Xmax, Ymax) = (800, 400) then calculate the address of (150, 200). Assume bi-level system.	4
	B	**Differentiate following:** 1. Raster scan system and Random scan system 2. DDA and Bresenham's line drawing algorithm	4
	C	Simulate the points for line points A (1, 1) and B (8, 5) using Bresenham's line drawing algorithm.	4

OR

Que. – 1			12
	A	Write a modified Bresenham's Line Drawing Algorithm that produces a dash line pattern.	4
	B	List out the techniques for color CRT monitors. Explain any one of them in detail.	4
	C	Simulate the points for the circle having radius R= 14 and center point as origin using Mid-point circle algorithm.	4

Que. – 2			11
	A	**Prove following:** 1) Two Successive translations are additive. 2) Two Successive Rotations are multiplicative. 3) Two successive scaling are multiplicative.	6
	B	Explain Cohen-Sutherland line clipping algorithm and find clipped line (Interior) for Given clip window and Input line **Top left corner (25,35) and right bottom corner (45,10) of Clip Window** **Input line** X1, Y1 → (30, 38) X2, Y2 → (50, 15)	5

OR

Que. – 2			11
	A	Apply the shearing transformation to Square with A(0,0), B(1,0), C(1,1) and D(0,1) as given below: a) Shear parameter value of 0.5 relative to line Yref = -1 b) Shear parameter value of 0.5 relative to line Xref = -1	6
	B	Explain Liang-Barsky line clipping algorithm and find clipped line (Interior) for Given clip window and Input line **Top left corner (5,35) and right bottom corner (40,25) of Clip Window** **Input line** X_1, Y_1 → (10, 20) X2, Y2 → (15, 40)	5

Que. – 3	Answer the following:		12
	A.	**Define following terms:** 1. Resolution 4. Frame buffer 7. Bitmap 2. All-or-none string clipping 5. Pixel phasing 8. Initiator 3. Rigid-body transformation 6. Horizontal Retrace	8
	B.	Application of computer graphics.	4

Que. – 4　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　12

A　Show that reflection of the object with respect to origin is same as rotation of the object　4
with θ =180 degree.

B　Which algorithms are used to fill the color in the object? Explain an algorithm which is　4
used to fill the object which having multicolor boundary.

C　What is anti-aliasing? Explain super sampling and area sampling techniques of anti-　4
aliasing in detail.

OR

Que. – 4　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　12

A　Derive the Matrix representation for Reflection of an object with respect to the line y=x.　4

B　**Explain following:**　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　4
　　1.　Nyquist sampling frequency
　　2.　Pixel phasing

C　Discuss Editing Structure primitives with Example.　　　　　　　　　　　　　　　4

Que. – 5　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　11

A　What is Halftone approximation? Explain it with 3x3 pixel grid.　　　　　　　　　6

B　What is Logical Classification of input devices? Explain any THREE in detail　　5

OR

Que. – 5　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　11

A　**Answer the following:**　　　　　　　　　　　　　　　　　　　　　　　　　　　6
　　1.　Point clipping
　　2.　Refresh CRT
　　3.　Classification of Fractals.

B　What is pivot point rotation? Rotate the diamond shaped polygon whose vertices are　5
A (-1,0), B(0,-2), C(1,0) and D(0,2) about the pivot point P(-1,-1).

Que. – 6　**Answer the following:**　　　　　　　　　　　　　　　　　　　　　　　12

A　What is transformation? Explain Three Dimension scaling transformation.　　　　6

B　Explain following 3D display methods in detail:　　　　　　　　　　　　　　　6
　　1.　Depth Cueing
　　2.　Perspective Projection
　　3.　Surface Rendering

END OF PAPER