[Total No. of Questions: 12] **[Total No. of Printed Pages: 3]**

UNIVERSITY OF PUNE
[4362]-218
S. E. (Computer)(Second semester) Examination - 2013
COMPUTER GRAPHICS (2008 Course)
[Time: 3 Hours] **[Max. Marks: 100]**

Instructions:

1. *Answers to the two sections should be written in separate answer-books.*
2. *Attempt q. No. 1 or q. no2, Q. No. 2, Q. No. 3 or Q. No. 4, Q. No. 5 or Q. No. 6 from Section I and Q No. 7 or Q. No. 8, Q. No. 9 or Q. No. 10. Q. No. 11 or Q No. 12 from section II.*
3. *Black figures to the right indicate full marks.*
4. *Neat diagrams must be drawn wherever necessary.*
5. *Assume suitable data, if necessary.*
6. *Answer any three questions from Section I and any three questions from Section II*

SECTION -I

Q.1 A) Explain Bresenham's circle drawing algorithm in detail. Also explain error factor with derivations [12]

B) Explain the various character generation methods [6]

OR

Q.2 A) Consider the line from (0,0) to (6,6) Bresenham's algorithm to rasterize this line. [6]

B) Explain following terms with suitable example: [6]

i) Pixels

ii) Resolution

iii) Frame buffer.

C) What is antialiasing? Explain any two antialiasing [6]

techniques.

Q. 3	A)	Enlist any three polygon filling algorithms. Explain even-odd method of inside test.	[8]
	B)	What is window and clipping? What is interior and exterior clipping?	[8]
		OR	
Q. 4	A)	Explain Cohen-Sutherland outcode algorithm with example.	[8]
	B)	Enlist any three methods of polygon filling Explain how polygon is filled with pattern.	[8]
Q. 5	A)	Write a note on Parallel and Perspective projection and state their types.	[8]
	B)	Describe 3D viewing transformations	[8]
		OR	
Q. 6	A)	Magnify the triangle with vertices A(0,0) B(1,1) C(5,2) to twice its size as well as rotate it by 45^{o}. Derive the translation matrices.	[8]
	B)	Derive the transformation matrix for rotation about an arbitrary point.	[8]

SECTION II

Q. 7	A)	What is a segment table? Explain the operations that can be performed on a segment table?	[8]
	B)	What are the various methods of controlling animation? Explain in detail.	[8]
		OR	
Q. 8	A)	Explain the data structures that can be used to	[8]

implement the segment table.

B) Explain morphing? What is simulating acceleration? [8]

Q. 9 A) Explain the following in detail [18]

i) Diffuse Illumination

ii) Specular Reflection

iii) Gouraud method of shading

iv) CIE Chromaticity Diagram

v) Color Models

vi) Ray tracing

OR

Q. 10 A) Explain various surface shading algorithms [8]

B) Explain the following with the help of an example [10]

(i) BSP tree

(ii) Backface removal algorithm

Q.11 A) What are fractals? Explain how fractal line algorithm can be used for generating fractal surface. [8]

B) Explain any two hidden surface removal algorithms. [8]

OR

Q. 12 A) Write short notes on [16]

i) B Splines

ii) Bezier Curves

iii) Fractals

iv) 3D Studio/Maya