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	MANIPAL INSTITUTE OF TECHNOLOGY (Constituent Institute of Manipal University) MANIPAL-576104	
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V SEMESTER B.Tech (COMPUTER SCIENCE & ENGINEERING) DEGREE END SEMESTER
 EXAMINATION - DECEMBER 2013
SUBJECT: COMPUTER GRAPHICS (CSE 307)
DATE: 10/12/2013

TIME : 3 HOURS

MAX.MARKS : 50

Instruction to Candidates

- ANSWER ANY FIVE FULL QUESTIONS

- 1A) With a neat diagram explain the working of monochrome CRT.
- 1B) Discuss the shortcomings of DDA line drawing method. Use Bresenham's procedure to rasterize a line from (10, 12) to (20, 18).
- 1C) Given a clipping window P(0,0), Q(340, 0), R(340, 340) and S(0, 340), find the visible portion of the lines AB[(-170, 595), (170, 255)] and CD[(425, 85), (595, 595)] against the given window, using Parametric line clipping algorithm. **(3+3+4)**
- 2A) Derive the necessary decision parameters to draw an ellipse using Mid-point technique.
- 2B) Use Sutherland-Hodgeman polygon clipping algorithm to clip the polygon defined by vertices A(1, 4), B(13, 1), C(5, 11) and D(5, 7) against the window [(2, 3) to (10, 9)]. Find the resulting polygon with all the coordinates of the vertices. Clearly show the intermediate vertices resulting from clipping against each edge in the order left, right, bottom and top.
- 2C) Explain the four rules used in polygon filling. **(4+4+2)**

- 3A) Find the viewing from a window in the world coordinates with x extent 3 to 12 and y extent 2 to 10 onto a viewport with x extent $\frac{1}{4}$ to $\frac{3}{4}$ and y extent 0 to $\frac{1}{2}$ in device space and then map a workstation window with x extent $\frac{1}{4}$ to $\frac{1}{2}$ and y extent $\frac{1}{4}$ to $\frac{1}{2}$ in the device space into a workstation viewport with x extent 1 to 12 and y extent 1 to 12 on the physical display device. Find the complete viewing transformation matrix.
- 3B) Obtain the co-ordinates of the point (50,10), after shearing it along a line $Y=10X-7$. The shear factor along the x-axis is given as 4.
- 3C) Explain the Depth Buffer method for visible surface determination. Also mention its pros and cons. **(3+3+4)**
- 4A) Rotate a cube given by coordinates A(2, 1, 2), B(3, 1, 2), C(3, 1, 1), D(2, 1, 1), E(2, 2, 2), F(3, 2, 2), G(3, 2, 1) and H(2, 2, 1) about its diagonal pointing away from the origin by 45 degrees.
- 4B) Define Perspective and Parallel projections. Explain different projections under each one of them. **(4+6)**
- 5A) Determine eleven points on a Bezier curve with equidistant parametric values, having control points P1(50, 180), P2(250, 100), P3(600, 300) and P4(500, 50), distribute over a screen of resolution 640*350.
- 5B) Explain the basic illumination model in computer graphics. **(4+6)**
- 6A) Explain the following types of motion specifications.
 (i) Direct motion specification
 (ii) Goal directed systems
 (iii) Kinematics and Dynamics
- 6B) Why is it not possible to have a high resolution Shadow mask CRT? For a colour monitor screen that is 15.5 inches wide and 11.6 inches high, what will be the resolution of the screen if the distance between the triads (pitch) is 0.25 millimeter.
- 6C) Describe various properties of parametric curves. **(5+2+3)**
