

Total number of printed pages – 4

MCA  
PCS 3007

Fourth Semester Examination – 2008

COMPUTER GRAPHICS

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory  
and any five from the rest.

Figures in the right hand margin  
indicate marks.

1. Answer the following questions : 2×10
- (a) What is the difference between rasterization and scan conversion ?
  - (b) Write the use of error term in Bresenham's line drawing algorithm.
  - (c) What are the disadvantages of seed fill algorithms ?

P.T.O.

- (d) Differentiate between parallel and perspective projections.
- (e) Write down the role of scan conversion in seed fill algorithms.
- (f) Justify the use of special purpose of graphics processors.
- (g) Differentiate between windows and viewports.
- (h) What do you understand by the resolution of the CRT?
- (i) How does the refreshing rate affects the interlace and non-interlace displays?
- (j) List down the advantages of user interface over command-line interface.
2. (a) Explain the storage tube graphics display mechanism with its advantages and disadvantages. 4
- (b) What is the frame buffer? How can the intensity levels of pixels be increased using look-up table? Illustrate your answer taking an n-bit plane with a w-bit wide look-up table. 3+3

3. (a) Discuss the Bresenham's integer line generation algorithm. 5
- (b) Explain how it works on the points (5,5) to (10,7)? 5
4. (a) What is clipping? Explain Cohen-Sutherland clipping algorithm with an example. 5
- (b) Given a window A(20,20), B(60,40), C(60,40), D(20,40). Use Cohen Sutherland algorithm to find the visible portion of the line P(40,80) - Q(120,30) inside the window? 5
5. (a) What are the ground rules for graphics software design? What are the common graphic primitives, windowing functions and utility functions in a graphics package? 5
- (b) Develop the formulae to compute the address of raster in frame buffer displays. 5
6. (a) Perform a  $45^\circ$  rotation of a triangle A(0,0), B(1,1), C(5,2) 2
- (i) about the origin

(ii) about  $P(-1,-1)$

(b) Magnify the triangle with vertices  $A(0,0)$ ,  $B(1,1)$ ,  $C(5,2)$  to twice its size while keeping  $C(5,2)$  fixed. 4+4

7. (a) What are Gourad and Phong Shading ? 5

(b) Explain Warnocks algorithm for hidden surface removal. 5

8. (a) Write some important properties for designing curves ? 3

(b) What is Bezier curve ? State some important properties of Bezier Curve. 3

(c) Write the Bezier equation and draw the Bezier curve using a set of control points  $(1,5)$ ,  $(2,2)$ ,  $(5,2)$ ,  $(7,5)$  and  $(9,2)$ . Test the order of continuity by the above curve. 4