

**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 :  $2 \times 10$
- (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 ?

- (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

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**Contd.**

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