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B.Tech. 5th Semester (CS & IT) F-Scheme  
Examination, December-2017  
COMPUTER GRAPHICS  
Paper-CSE-303-F

Time allowed : 3 hours]

[Maximum marks : 100

Note : Question No. 1 is compulsory. Attempt five questions  
in total selecting one question from each unit.

1. Explain the following : 4×5=20
- (a) Applications of computer graphics.
  - (b) Window to viewport mapping.
  - (c) Types of projections.
  - (d) Coefficient of reflection and halfway vector.

Section-A

2. (a) Write the step required to plot a line whose slope is between  $0^\circ$  and  $45^\circ$  using the slope-intercept equation. 10
- (b) Indicate which raster location would be chosen by Bresenham's algorithm when scan-converting a line from pixel coordinate (1, 1) to pixel coordinate (8,5). 10
3. Explain the architecture of Raster Scan Display. Give the logical organization of a Video Controller and explain its importance in Raster Scan display. 20

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**Section-B**

4. (a) Perform a  $60^\circ$  rotation of triangle A(0,0), B(1,1), C(5,2)
  - (i) About the origin and 10
  - (ii) About P(-2,-2). 10
- (b) Write the general form of a shearing matrix with respect to a fixed point P(h,k). 10
5. Contrast the efficiency of clipping between Sutherland-Cohen and Mid-point algorithm. Describe Sutherland-Hodgeman algorithm for polygon clipping. Explain why this algorithm works for convex polygons. 20

**Section-C**

6. (a) Write 3D transformation matrix to find reflection of a point P (15, 25, 35) about plane  $z = 0$ . 10
- (b) What is oblique projection ? Provide some examples of oblique projection. 10
7. Write notes on : 20
  - (a) Z-buffer algorithm
  - (b) Geometric projections.

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**Section-D**

8. (a) Explain Bezier method of curve drawing. 10
- (b) Describe methods of polygon shading. 10
9. Write notes on : 20
  - (a) Bezier curve
  - (b) B-spline curve
  - (c) Fractals

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