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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CSE) (Sem.-5<sup>th</sup>)  
**COMPUTER GRAPHICS**  
Subject Code : CS-309  
Paper ID : [A0468]

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

**SECTION-A**

1. Answer the following :
  - a. What is a Raster Scan System?
  - b. What is a Random Scan System?
  - c. What is view port and window?
  - d. What is a Device Coordinate System?
  - e. Explain the procedure to convert the normalized device coordinate to the device coordinate used by the output devices.
  - f. What is a normalized coordinate system?
  - g. What is a Halftone Image?
  - h. What is Constant Intensity Shading?
  - i. What is Parallel and Perspective projection? Explain.
  - j. What is Aspect Ratio?

### SECTION-B

2. Consider a raster system with a resolution of  $1024 \times 1024$ . What is the size of the raster needed to store 4 bits per pixel ?
3. Find the mirror image of the triangle ABC about  $y = x$  axis with the help of matrices. What do you understand by homogeneous coordinates?
4. Derive the 3D transformation matrix for rotating an object by an angle in a direction of Y Z Plane.
5. Explain the Gourard shading model.
6. Define an efficient polygon representation for the cylinder. Justify your choice of the representation.

### SECTION-C

7. What are the different input devices of graphics system? Explain the working principle of each of them.
8. What do you understand by clipping, windowing and viewporting? Discuss Sutherland- Cohen Algorithm in detail.
9. What is the criteria of generating a straight line on a raster scan display device? Write an algorithm to generate a straight line using Bresenham's algorithm.