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B.Tech.(CSE) (2011 Onwards) (Sem.-5) COMPUTER GRAPHICS

Subject Code: BTCS-504 Paper ID: [A2100]

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 have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

#### **SECTION-A**

# I. Write briefly:

- a. What do you mean by scan conversion?
- b. What are homogeneous coordinates? How are they useful?
- c. Write a general transformation matrix for shearing in x-direction.
- d. List various applications of Computer Graphics.
- e. Why railway tracks appears to converge at horizon?
- f. Define clipping.
- g. Find the matrix that represents rotation of an object by 30° about the origin.
- h. What do you mean by vanishing points?
- i. What do you mean by rendering?
- i. What are fractals?

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## **SECTION-B**

- II. Differentiate between raster scan systems and random scan systems.
- III. Find the transformation matrix for reflection about a line L with slope m and y intercept (0,b).
- IV. What do you mean by window and viewport? Describe window to viewport transformation.
- V. What is the difference between Boundary-fill and Flood-Fill algorithms? Write 8-boundary fill algorithm.
- VI. Describe z-buffer algorithm for hidden surface elimination.

# **SECTION-C**

- VII. Derive the decision parameter expressions for Bresenham line drawing algorithm. Write Bresenham line drawing algorithm and explain how it is better than DDA algorithm for line generation.
- VIII. Describe in detail Sutherland-Hodgeman polygon clipping algorithm. What are its shortcomings?
- IX. Write short notes on :
  - a. Gouraud and Phong Shading
  - b. Edge fill and fence fill algorithms

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