JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
T3 EXAMINATION- 2023
B. Tech 5th Semester (CSE)

COURSE CODE (CREDITS): 18B11CI515 (3) MAX. MARKS: 35
COURSE NAME: Computer Graphics MAX. TIME: 2 Hours
COURSE INSTRUCTORS: Dr. Amol Vasudeva, Dr. Anita, Dr. Nancy Singla and Mr. Prateek

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Note: (a) All questions are compulsory.
(b) Marks are indicated against each question in square brackets.
(c) The candidate is allowed to make suitable assumptions wherever required

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1.
(a) Write down the steps of DDA line drawing algorithm. Use this algorithm to draw a line between end points (0, 0) and (8,4) (CO-2) **[3 marks]**
(b) Differentiate between active and passive Graphics devices. (CO-1) **[2 marks]**

2. Consider a square A (1, 0), B (0, 0), C(0, 1), and D (1,1), Rotate it by 45 degrees clockwise about the point (1, 0). Identify all new coordinates of the square. (CO-3) **[4 marks]**

3. Use Nicholl-Lee-Nicholl algorithm to Clip a line AB against the clipping window whose lower left corner is (10, 10) and upper right corner is (40, 40) where A (5, 20) and B (50, 30). (CO-2) **[4 marks]**

4. Given a homogeneous point (1, 2, 3). Apply rotation 90 degree towards X, Y and Z axis and find out the new coordinate points. (CO-4) **[4 marks]**

5. Based on the Fig. 1, use Constructive Solid Geometry (CSG) model to perform the following:
- Identify the primitives from Fig. 1
- Apply Boolean operations on the primitives
- Construct a binary tree structure based on the Boolean operations. (CO-5) **[4 marks]**

6. Construct a quad tree for an image given in the shaded area (Fig. 2) up to three levels. (CO-5) **[5 marks]**

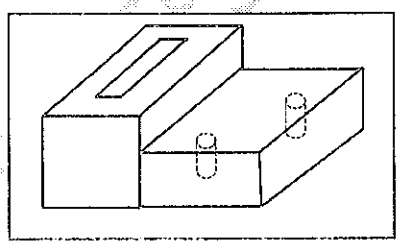

Fig. 1

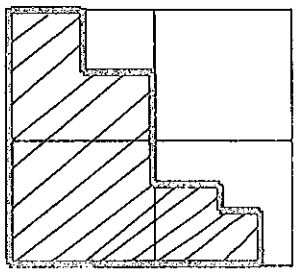

Fig. 2

7. Differentiate between the following terms with suitable examples: (CO-5)
a) Parallel and perspective projections. **[3 marks]**
b) Translational Sweep and Rotational Sweep **[3 marks]**
c) Bezier and B-Spline Curve **[3 marks]**