

Day : Saturday  
Date : 17/11/2018

**W-2018-2871**

Time : 10.00 AM TO 01.00 PM  
Max. Marks : 80

**N.B.:**

- 1) **Q.No.1** and **Q.No.5** are **COMPULSORY**. Out of the remaining attempt **ANY TWO** questions from each section.
- 2) Answers to both the section should be written in **SEPARATE** answer books.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Figures to the right indicate **FULL** marks.
- 5) Assume suitable data if necessary.

**SECTION – I**

- Q.1** a) Scale Quadrilateral ABCD with coordinates A (2, 5), B (7, 10), C (10, 2) and D (12, 8) by 2 units in X direction and 2 units in Y direction. Show results graphically. [07]  
b) Write C program for Digital Differential Analyzer Algorithm. [07]
- Q.2** a) Using a suitable diagram, discuss “Color Raster Refresh Display”. [05]  
b) Discuss in brief any four applications of “Interactive Computer Graphics”. [04]  
c) Using a suitable diagram, explain the operation of an “Ink Jet Printer”. [04]
- Q.3** Derive the relation for decision parameter for line generation using Bresenham Algorithm. Write a program for same. [13]
- Q.4** Reflect the polygon with co-ordinates A(-1, 0), B(0, -2), C(1, 0) and D(0, 2) about line: [13]  
i)  $y = 2$                       ii)  $x = 2$                       iii)  $y = x + 2$

**SECTION – II**

- Q.5** a) Write the rotation matrices for rotating any entity in three-dimensional space about their coordinate axes. [05]  
b) What is window and viewport? Explain. [04]  
c) A line  $L_1$  is drawn between two points  $P_1(3, 5, 9)$  and  $P_2(6, 7, 3)$  and  $L_2$  is drawn between  $P_3(6, 5, 3)$  and  $P_4(3, 8, 9)$  [05]  
i) Find parametric equation of the lines.  
ii) Find the tangent vector.  
iii) Are the two lines intersecting? If yes, determine the point of intersection.
- Q.6** A point P (7, 8, 0) is lying in xy plane. Rotate the point clockwise about line parallel to X-axis and situated at a distance 5 unit and lying in xy plane. Find the transformed coordinate of a point. Explain the transformation steps graphically. [13]
- Q.7** Clip the triangle ABC with co-ordinates (15, 7) (30, 7) and (30, 27) against a window with parameters (10, 25, 5, 15). Use Cohen Sutherland and algorithm. [13]
- Q.8** Explain how Euler’s operations are used in geometric modeling. [13]