

[Total No. of Questions: 09]

[Total No. of Pages:]

Uni. Roll No.

Program: **B.Tech**

Semester: **6th**

Name of Subject: **Computer Graphics**

Subject Code: **PCCS-113**

Paper ID: **17189**

Time Allowed: 02 Hours

Max. Marks: 60

NOTE:

- 1) Each question is of 10 marks.
- 2) Attempt any six questions out of nine
- 3) Any missing data may be assumed appropriately

- Q1.** How surface rendering is important for the display of objects? Discuss and compare Gouraud and Phong shading techniques for surface rendering.
- Q2.** Discuss the need of Hidden surface removal techniques? How visible surfaces are detected using z-buffer algorithm ?
- Q3.** Derive the expression for decision parameter used in Bresenham's Circle drawing algorithm. Using Bresenham's circle drawing algorithm , find the coordinates of pixels that lie on the boundary of circle with radius 6 and centre as (3,2).
- Q4.** Explain the terms projection plane, view plane and view volume with references to 3d graphics. State and explain the anomalies of perspective projection.
- Q5.** Consider the square (0,0), (0,3), (3,0) , (3,3) . Perform the composite transformations of the square by using the following steps:
- i) Scale by using $s_x=2$ and $s_y=3$.
 - ii) Rotation by 45 degree in the anticlockwise direction.
 - iii) Translate using $t_x=3$ and $t_y=6$.

- Q6.** Use the Liang-Barsky algorithm to find out visible portion of two lines $P1(40,15)$ - $P2(75,45)$ and $P3(70,20)$ - $P4(100,10)$ against a window $A(50,10), B(80,10), C(80,40), D(50,40)$.
- Q7.** Explain in detail scan line polygon fill algorithm. Describe the problem that the algorithm encounters when a scan line passes through a vertex?
- Q8.** Distinguish between raster and random scan display systems? Discuss each in detail with their merits and limitations.
- Q9.** (a) Differentiate between Parallel and Perspective projections.
(b) Describe the shortcomings of Sutherland-Hodgeman polygon clipping algorithm.
