[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2124)

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M. Tech 3rd Semester Examination

Computer Graphics

MT-301

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : This paper contains two questions from each unit and candidate is required to attempt one question from each unit. Question number nine is compulsory, which is a short answer type question. In all, five questions are to be attempted. Each question carries 20 marks.

UNIT - I

1. What is computer graphics and what are its applications? Explain raster scan displays in detail? (10+10=20)

OR

2. Explain the working of any four of the following:

   (a) Direct view storage tubes

   (b) Printers

   (c) Scanners

   (d) Touch panels

   (e) Digitisers (5×4=20)

[P.T.O.]

UNIT - II

3. Explain the various steps involved in DDA line drawing algorithm? Why is Bresenham's algorithm preferred over DDA algorithm? Indicate raster locations that would be chosen by DDA algorithm while scan converting a line with end-points (0, 0) and (5, 8)? (8+4+8=20)

OR

4. Discuss an algorithm for ellipse generation. Perform a 60° rotation of triangle A(0, 0), B(1, 1) and C(5, 2) about P(–1,–1)? (10+10=20)

UNIT - III

5. Explain Sutherland-Hodgeman polygon clipping algorithm with suitable example. Explain the method of Text clipping with suitable example. Discuss some of the significant clipping operations? (10+5+5=20)

OR

6. Find complete transformation that

   (a) maps a window in world coordinates with both x-extent and y-extent from 1 to 10 mapped onto a viewport with x-extent ¼ to ¾ and y-extent from 0 to ½ in normalized device space.

   (b) Further maps a window with x-extent ¼ to ½ and y-extent ¼ to ½ in normalized device space onto a viewport with x-extent 1 to 10 and y-extent 1 to 10 on physical display device. (20)

UNIT - IV

7. What do you understand by shading? Explain visible surface detection methods. (5+15=20)

OR

8. What are B-spline and Bezier curves? What are the properties of Bezier - B-spline approximations? (12+8=20)

UNIT - V (Compulsory)

9. Do any five out of the following:

   (a) What is the need of homogeneous coordinate system in 2D and 3D transformations?

   (b) Explain aliasing and anti-aliasing.

   (c) What is resolution? Define aspect-ratio of a screen.

   (d) Differentiate between parallel and perspective projections.

   (e) What are fractals? What are its applications?

   (f) Give Three-Dimensional homogeneous matrix transformations for

      1. Translation
      2. Rotation along z-axis
      3. Scaling
      4. Reflection about XY plane (5×4=20)