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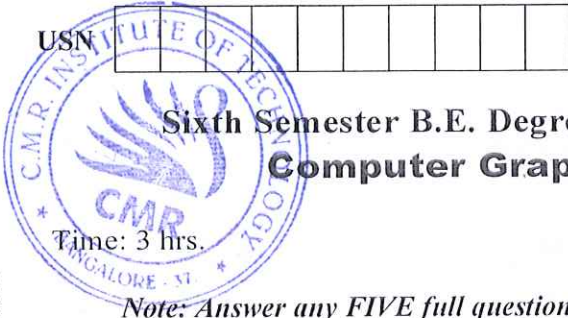**Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020**
Computer Graphics and Visualization

Time: 3 hrs.   Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a. Describe various applications of computer graphics with appropriate examples. **(08 Marks)**
    b. With a neat diagram, explain the architecture of a raster display system with integrated display processor. **(08 Marks)**

OR

2   a. With necessary steps explain Bresenham's line drawing algorithm. Consider the line from (5, 5) to (13, 9), use the Bresenham's algorithm to rasterize the line. **(08 Marks)**
    b. Explain with diagram the different Cartesian reference frames are used in the process of constructing and displaying a scene. **(08 Marks)**

Module-2

3   a. Explain with example any two algorithms used for to identify the interior area of a polygon. **(06 Marks)**
    b. Explain with illustrations the basic 2-dimension geometric transformations used in computer graphics. **(06 Marks)**
    c. Explain the different Open GL routines used for manipulating display window. **(04 Marks)**

OR

4   a. Explain the scan line polygon filling algorithm. And also explain the use of sorted edge table and active edge list. **(08 Marks)**
    b. What is the need of homogeneous coordinates? Give 2-dimension homogeneous coordinate matrix for translation, rotation and scaling. **(04 Marks)**
    c. Obtain a matrix representation for rotation of a object about a specified pivot point in 2-dimension. **(04 Marks)**

Module-3

5   a. What is clipping? Explain with example the Sutherland-Hodgman polygon clipping algorithm. **(08 Marks)**
    b. Explain basic illumination models. **(08 Marks)**

OR

6   a. Explain RGB and CMY color models with examples. Explain the transformation between CMY and RGB color spaces. **(08 Marks)**
    b. Obtain the matrix representation for rotation of a object about an arbitrary axis. **(08 Marks)**

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Module-4

7 a. Explain the 2 classifications of visible surface detection algorithm. (04 Marks)
  b. Explain with example the depth buffer algorithm used for visible surface detection. And also list the advantages and disadvantages of depth buffer algorithm. (07 Marks)
  c. Bring out the differences between perspective and parallel projections. (05 Marks)

OR

8 a. Explain the OpenGL 3-dimensional viewing functions. (06 Marks)
  b. What is projection reference point? Obtain the general and special case perspective transformation equations. (06 Marks)
  c. Explain Back-face detection method with example. (04 Marks)

Module-5

9 a. Explain the logical classifications of input devices with examples. (06 Marks)
  b. Discuss request mode, sample mode and event mode with figures. (06 Marks)
  c. List the various features that a good interactive program should include. (04 Marks)

OR

10 a. Explain how an event driven input can be performed for a keyboard and mouse device. (06 Marks)
   b. List the properties of Bezier curve. And also explain Bazier techniques of generating curves. (10 Marks)

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