Total No. of Questions :8] *[Total No. of Printed Pages :2*

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MCTA-105

M.E./M.Tech., I Semester

Examination, December 2014

Computer Graphics and Multimedia

Time : Three Hours

Maximum Marks: 70

Note: i) Answer any five questions.

ii) All questions carry equal marks.

iii) All parts of the questions must be answered in one place only.

1. a) What is meant by refreshing of the screen? What is refresh buffer? Identify the content and organization of refresh buffer for the case of raster display system?

   b) How long it will take to load a 640 by 480 frame buffer with 12 per pixel if 10^5 bits can be transferred per second? How long it will take to load a 24-bits per pixel frame buffer with resolution of 1280 by 1024 using the same transfer rate.

2. a) Investigate the effect of the transformations T1 and T2 on a triangle having co-ordinates A(2, 2), B(4, 2) and C(4, 4), where T1 denotes rotation through 90 degrees in the counter clockwise direction and T2 denotes a reflection with respect to the line $y = -x$. Do we obtain the same result when the two transformations are applied in the reverse order.

   b) Explain Weiler-Atherton polygon clipping algorithm and state its advantage over Sutherland-Hodgeman polygon clipping algorithm.

3. a) A mirror is placed such that it passes through (2, 0) and (0, 2). Find the reflected view of a triangle with vertices (3, 4), (5, 5) and (4, 7) in this mirror.

   b) Explain Sutherland-Cohen line Clipping algorithm. Is this applicable to any of the window? Justify your answer.

4. a) Obtain a transformation matrix for rotation about the line joining the point (0, 0, 0) and (1, 1, 1) with the angle of rotation 45° in counter clockwise sense.

   b) Find the projection of point (5, 2, 8) onto the plane $Z = 3$ with Centre of Plane at (0, 0, 5).

5. a) Write a short note on the perspective projections clearly explaining vanishing points and view volumes.

   b) Explain the following terms with relevant diagram:
   i) Orthogonal projection
   ii) Axonomic and Isometric orthogonal projection

6. a) Discuss the characteristics of Bezier curves and Bezier surfaces in detail.

   b) Write notes on RGB and HSV color models.

7. a) Explain the Z-Buffer method of Hidden Surface removal.

   b) Explain the Phong shading model for rendering of polygon surfaces.

8. a) Explain the Multimedia system architecture in detail? Explain the TIFF file format.

   b) Explain MPEG file format for motion picture compression.

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