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Roll No. ....

MCTA–105

M. Tech. (First Semester)
EXAMINATION, Dec., 2010
COMPUTER GRAPHICS AND MULTIMEDIA

(MCTA–105)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt all questions. All questions carry equal marks.

1. (a) Explain the structure of monochrome and colour CRT.

    8

    (b) What is the rate of a 1024×1024 frame buffer with an average access rate per pixel of 200 ns on a simple colour display.

    8

    (c) Explain the random display technique.   4

Or

2. (a) What is access rate/pixel of a 4096×4096 raster having a refresh rate of 30 frames/sec.   8

    (b) List the various hard copy display devices and also comment on their merits and limitations.   8

    (c) Write the applications of computer graphics.   4

3. (a) $d_{i+1} = \begin{cases} d_i + 4x_i + 6 & \text{if } d < 0 \\ d_i + 4(x_i - y_i) + 10 & \text{if } d_i \geq 0 \end{cases}$

Derive the above following formula using Bresenham's circle algorithm. 15

(b) What is raster transformation ? Where is raster transformation used ? 5

Or

4. (a) Reflect the diamond-shaped polygon whose vertices are A $(-1, 0)$, B $(0, -2)$, C $(1, 0)$ and D $(0, 2)$ about : 15

(i) Horizontal line $y = 2$

(ii) Vertical line $x = 2$

(iii) The line $y = x + 2$

(b) What is Reflection ? List the different reflections with suitable example. 5

5. (a) Find the mirror reflection transformation with respect to a plane passing through point P $(2, 2, 2)$ and having a normal vector : 15

$$N = I + J + K$$

(b) Explain parallel projection. 5

Or

6. (a) Derive the equation of parallel projection on to the xy-plane in the direction of projection : 10

$$V = aI + bJ + cK$$

(b) What is vanishing point and define one point, two point, three point perspective projection ? 10

7. (a) Explain uniform cubic and non-uniform cubic B-spline curve. 8

(b) Explain Blending Functions. 4

(c) Compare the Ray casting method with the Z-Buffer method. 8

Or

8. (a) Explain the back face removal algorithm. What are the limitations of the back face removal method ? 10

(b) Explain the property of B-spline and Bezier curve. 10

9. Write short notes on any *two* of the following : 10 each

(a) Authoring tools

(b) JPEG and MPEG

(c) RTF and TIFF

(d) Graphics Animation

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