Code No: P0501/R05

$\boxed{\textbf{Set No. 4}}$

III B.Tech II Semester Supplementary Examinations, Nov/Dec 2009
**COMPUTER GRAPHICS**
(Computer Science & Engineering)

**Time: 3 hours** **Max Marks: 80**

**Answer any FIVE Questions**
**All Questions carry equal marks**
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1. (a) Suppose we have a computer with 32 bits per word and a transfer rate of 1 mip (one million instructions per second). How long would it take to fill the frame buffer of a 300 ? dpi (dot 8 per inch) laser printer with a page size of 8 $\frac{1}{2}$ inches by 11 inches.

   (b) Explain the applications of computer graphics in [10+6]
       i. entertainment and
       ii. education and training.

2. (a) Write Bresenham's algorithm for line generation which is suitable for any slope.

   (b) Using the above algorithm, generate the intermediate points of the line segment, if the two end-points are given as (30,18) and (20,10). [8+8]

3. Determine the form of the transformation matrix for a reflection about an arbitrary line with equation y = mx+b. [16]

4. Explain the algorithm for line clipping by Cohen-Sutherland algorithm. Demonstrate with an example all the three cases of lines. [16]

5. (a) Derive the basis matrix $(M_B)$ for Bazier curve.

   (b) What are Bernstein polynomials? What is their significance in Bazier curve? [8+8]

6. (a) Derive the quaternion rotation matrix for rotation about an arbitrary axis in three-dimensional domain.

   (b) Classify the perspective projections and explain about each. [8+8]

7. (a) Distinguish between object-space and image space methods of visible surface detection algorithms. Give examples for each.

   (b) Given points P (1, 2, 0), P (3, 6, 20) P (2, 4, 6) and a view point C (0, 0, -10), determine which points obscure the others when viewed from C. [8+8]

8. Define an animation specification involving both acceleration and deceleration and implement the in between spacing calculations. [16]

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