Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.Tech-IT(SE)/SEM-3/MSE-302C/2009-10

2009

COMPUTER GRAPHICS AND MULTIMEDIA

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any *five* of the following.

1. a) Explain briefly the RGB and CMY colour model.

   b) Write down the names of different image file formats.

   c) Give examples of some graphics device.

   d) What do you mean by resolution of an image ?

   e) Compute the size of a 640 × 480 image at 240 pixels per inch.

   f) Find the CMY cooordinates of a colour at (0·2, 1, 0·5) in RGB space.

   g) What is image's aspect ratio ? 7 × 2 = 14

2. a) Describe the Bresenham's circle drawing algorithm. 7

b) Find the matrix representation of a point about origin. Write the matrix representation of translation. 5 + 2

3. a) Prove that the uniform scaling ($S_x = S_y$) and a rotation form a commutative pair of operations but independently scaling and rotations are themselves not commutative. 6

b) Show that transformation matrix for a reflection about the line $y = -x$ is equivalent to a reflection relative to the y – axis followed by a counter-clockwise rotation of 90°. 8

4. a) What do you mean by viewport ? 2

b) Explain the Cohen-Sutherland line clipping algorithm. 8

c) Clip the line CD using Midpoint subdivision algorithm in a plain PQRS. Choose appropriate coordinate of the end points and use tolerance level 0·1. 4

5. a) Describe with figure, the structure and functions of a Cathode Ray Tube (CRT). 8

b) Distinguish between Raster Scan Display and Random Scan Display. 3

c) What do you mean by homogeneous coordinates ? 3

6. a) Describe the Bresenham's Line drawing algorithm (only the algorithm). 7

b) Describe the mid-point-sub division algorithm. 7

7. a) Find the equation of Bezier curve which passes through points (0, 0) and (– 2, 1) and is controlled through points (7, 5) and (2, 0). 8

b) Four points P_0 (a, b) , P_1 (20, 50) , P_2 (40, 40) , P_3 (70, c) are available for drawing a B-spline curve segment. Compute the values of a, b, c such that the curve starts from the point (21, 43) and terminate with slope $\frac{1}{2}$. 6

8. a) Describe the basic MPEG specification for video. 8

b) Discuss elaborately with illustration the difference between HTML & DHTML. 6