



Name :

Roll No. :

Invigilator's Signature :

**CS/M.Tech(CSE)/SEM-3/CSEM-302/2009-10
2009**

MULTIMEDIA AND GRAPHICS

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.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

$$10 \times 1 = 10$$

i) What will be the coordinates of a colour in RGB space, if the corresponding CMY coordinates are (0.3, 0, 0.6) ?

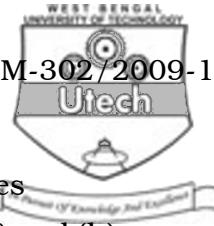
- a) (0.3, 0, 0.6) b) (0.3, 1, 0.6)
c) (0.7, 1, 0.4) d) (0.7, 0, 0.4).

ii) Which of the following is not an additive transformation ?

- a) Rotation b) Translation
c) Scaling d) Both (a) and (b).



- iii) In Cohen-Sutherland line clipping algorithm the region codes of two end points of a line are 1010 and 0011. Then the line is
- a) completely inside the window
 - b) completely outside the window
 - c) parallel to one window edge
 - d) none of these.
- iv) If (x, y, w) $w \neq 0$, is a point in the homogeneous coordinate system, the equivalent two-dimensional system is
- a) $(x, y, 1)$
 - b) $(x, y, 0)$
 - c) $(x/w, y/w)$
 - d) $(x, y, x - y)$.
- v) The Z buffer algorithm
- a) finds the largest depth value Z
 - b) finds the smallest depth value Z
 - c) finds the average of the frame buffer
 - d) calculates the intensity at (x, y) .
- vi) Which of the following compression/s is/are reversible ?
- a) Lossy
 - b) Lossless
 - c) Both
 - d) None of these.
- vii) JPEG encoding involves , a process that reveals the redundancies in a block.
- a) Blocking
 - b) the DCT
 - c) Quantization
 - d) Vectorization.
- viii) MP3 is
- a) compressed audio layer 3
 - b) MPEG audio layer 3
 - c) JPEG audio layer 3
 - d) none of these.



- ix) Independent frames of MPEG are
- | | |
|-------------|----------------------|
| a) I frames | b) P frames |
| c) B frames | d) both (a) and (b). |
- x) Faster scanning method is
- | | |
|------------------|----------------|
| a) Raster scan | b) Random scan |
| c) none of these | d) can't say. |
- xi) The process for giving life to the object is called
- | | |
|-----------------|---------------|
| a) Motion twine | b) Morphing |
| c) Masking | d) Animation. |

GROUP – B

(Short Answer Type Questions)

Answer any *four* of the following. $4 \times 5 = 20$

2. Derive the relationship for Window to Viewport mapping.
3. Discuss BSP Tree method.
4. Explain RGB and CMY colour models. Which one is called additive and subtractive colour model and why ? $3 + 2$
5. What is Homogeneous coordinate system and why is it so called ? $3 + 2$
6. Explain the terms : Morphing, Masking and Animation. $2 + 2 + 1$
7. Explain Sutherland-Hodgeman Polygon clipping algorithm.

GROUP – C

(Long Answer Type Questions)

Answer any *two* of the following. $2 \times 20 = 40$

8. a) Explain Bresenham's line drawing algorithm. 7
- b) Illustrate how would you generate pixel points for a line segment joining points (0, 0) with (5, 4) using the above algorithm. 6
- c) Draw a circle with radius = 7 cm using Midpoint Circle drawing algorithm. 7



9. a) Illustrate the technique for generating ellipse using midpoint ellipse algorithm for both region 1 and region 2. Given $rx = 8$ and $ry = 6$. 7 + 7
- b) Outline the basic steps necessary to reflect a figure in space with respect to an arbitrary plane. 6
10. a) Obtain a viewing transformation matrix that maps a window whose lower left corner is (1, 1) and upper right corner is at (3, 5) onto a viewport that has lower left corner at (0, 0) and upper right corner at (0.5, 0.5). 6
- b) Explain Cohen-Sutherland line clipping algorithm with an example. 7
- c) Suppose a window has its lower left corner at (- 2, - 1) and upper right corner at (3, 2). Using the above algorithm find the visible portion of the line joining points (- 3, 1), (1, 3). 7
11. a) Explain the different stages involved in a standard image compression and decompression technique. 10
- b) What are the advantages for using different frames in MPEG compression ? 4
- c) Use Huffman coding to derive a code word set using characters M through T and prove that it will be the minimum set by constructing the corresponding Huffman code tree where $M = 0.26$, $N = 0.24$, $O = P = 0.14$, $Q = R = S = T = 0.055$. 6
12. Write short notes on any *four* of the following : 4 × 5
- a) 3D Rotation
 - b) MIDI
 - c) Z Buffer Algorithm
 - d) Wireframe method
 - e) LZW compression
 - f) Functionality of refresh CRT
 - g) Shear transformation.