

**B.Tech Odd Semester (CBCS) Exam.,
December—2016**

INFORMATION TECHNOLOGY

(5th Semester)

Course No. : IT-504

(Computer Graphics and Multimedia)

Full Marks : 75

Pass Marks : 30

Time : 3 hours

- Note :*
1. Attempt **one** question from each Unit.
 2. Begin each answer in a new page.
 3. Answer parts of a question at a place.
 4. Assume reasonable data wherever required.
 5. The figures in the margin indicate full marks for the questions.

UNIT—I

1. (a) What are refresh buffer and refresh CRT? With a neat block diagram, explain the architecture of raster graphics system with display processor. 1+1+4=6
- (b) Define and explain shadow masking. 1+2=3

- (c) How do Bresenham's circle and midpoint circle drawing algorithms differ from each other? Write pseudocode for Bresenham's midpoint circle algorithm. Trace the algorithm for drawing a circle of radius 10 and circle octant in the first quadrant from $x = 0$ to $x = y$. 1+3+2=6
2. (a) What is scan line? Write the procedure for scan line polygon fill algorithm with the help of example. 1+5+5=11
- (b) Discuss odd-even method with special cases. What are scan line coherence and edge coherence? 2+2=4

UNIT—II

3. (a) What do you mean by basic transformation? Explain with suitable example. 1+3=4
- (b) Define reflection and shear. Explain reflection of—
 - (i) an object relative to an axis perpendicular xy -plane and passing through the origin;
 - (ii) an object with respect to the line $y = x$. 2+2+2=6
- (c) Magnify the triangle with vertices $A(0,0)$, $B(1,1)$ and $C(5,2)$ to twice its size keeping $C(5,2)$ fixed. 5

4. (a) Explain 'general pivot-point rotation' and 'general fixed-point scaling'. 2½+2½=5
- (b) Show that two scaling transformations are commutative. 3
- (c) Consider a triangle having vertices at A(0,0), B(5,1) and C(3,4). Rotate this triangle by 90°—
- (i) by the origin;
- (ii) about the point (2, 3). 3+4=7

UNIT—III

5. (a) Explain basic 3-D transformations with an example. 3
- (b) Explain in detail, 'coordinate axes rotations' and 'general three-dimensional rotations'. 2+2=4
- (c) State in brief polygon clipping with the help of an example. 8
6. (a) What is clipping? Define point clipping, line clipping and polygon clipping. 1+1+1+1=4
- (b) Explain the Sutherland-Hodgeman algorithm. 2
- (c) Explain the 'line clipping—Cohen-Sutherland algorithm' using a suitable example. 2+7=9

UNIT—IV

7. (a) What is multimedia? Discuss the features of multimedia. 2+5=7
- (b) Describe multimedia system architecture. 8
8. (a) Explain in brief 'types of sound'. 7
- (b) Write short notes on the following : 4+4=8
- (i) MIDI
- (ii) YMC Colour Model

UNIT—V

9. (a) What is compression? Why is compression needed? What are problems with data compression? 1+3+2=6
- (b) A source has five symbols x_1, x_2, x_3, x_4 and x_5 with probabilities 0.35, 0.19, 0.16, 0.15, 0.15 respectively. Construct Hofmann code and Hofmann tree with complete steps. 9
10. With the following symbols and their probability of occurrence, encode the message "went#" using arithmetic coding algorithms : 15

Symbols	e	n	t	w	#
Probability	0.3	0.3	0.2	0.1	0.1
