# YMCA UNIVERSITY OF SCIENCE & TECHNOLOGY, FARIDABAD
## B. TECH. ▆▆▆▆▆▆▆▆
### COMPUTER GRAPHICS (~~CE-210~~) IT-210

Time: 3 Hours                                                                                     Max. Marks: 60

Note: 1. It is compulsory to answer the questions of Part -1. Limit your answers within 20-40 word in this part.
2. Answer any four questions from Part -2 in detail.
3. Different parts of the same question are to be attempted adjacent to each other.
4. Assume suitable standard data wherever required, if not given.

## PART -1

Q1 (a) Define the terms: (i) Interlacing  (ii) persistence of phosphor                              (2)
(b) Differentiate between Area Coherence and Edge coherence.                                          (2)
(c) What is the size in bytes of the frame buffer needed for a raster system of 1024× 728 to store 12 bits per pixel?                                                                             (2)
(d) Show that two successive rotations are additive in nature.                                        (2)
(e) What is the main difference between the two types of area filling algorithms                      (2)
(f) What pixel coordinates will be selected when drawing a line using Bresenham's algorithm between points (3, 5) and (10, 10)                                                         (2)
(g) Reflect the triangle (-1,0), B(0,-2), C(1,0) about the line y=2.                                  (2)
(h) What are the two steps required to determine whether any given point $P1(x1,y1,z1)$ obscures $P2(x2,y2,z2)$?                                                                           (2)
(i) What do you mean by aliasing? Name the techniques used to overcome its effects                    (2)
(j) Find the projected points if the point to be projected is (2,7,8) and center of projection is at (0,0,-50)                                                                               (2)

## PART -2

Q2 (a) Compare the two line drawing algorithms on the following characteristics: methodology, Applications and the advantages & limitations.                                                   (5)
(b) Explain the working of raster scan systems. What are its types?                                   (5)

Q3 (a) Compute the transformation matrix required to translate a point (x,y) by distance 3 and 4 along x and y axis respectively and then rotate (x,y) anticlockwise by 45°                     (5)
(b) What are the steps required in viewing transformation to map world coordinate screen to device coordinates?                                                                              (5)

Q4    What do you mean by area filling? Discuss the scan line polygon fill algorithm in detail with the help of an example and by constructing a sorted edge table for it.                     (10)

Q5 (a) Why are hidden surface algorithms needed? Explain how the Z-buffer algorithm determines which surfaces are hidden?                                                                (5)
(b) What is meant by projection? Discuss its various types and derive the matrix for perspective and parallel projection.                                                                 (5)

Q6    Discuss the 4-bit code algorithm. Clip a line segment between the points A(1,3), B(5,17) so as to fit into a viewport with bottom left at (3,5) and top right at (8,12) using the above algorithm.                                                                                    (10)

Q7    Write short note on :
(a) Hypertext and hypermedia                                                                          (5)
(b) Standards for Image compression                                                                   (5)

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