YMCA UNIVERSITY OF SCIENCE AND RECHNOLOGY, FARIDABAD

(CE) BTECH EXAMINATION (Under CBS)

COMPUTER GRAPHICHS AND MULTIMEDIA (CE-305)

Time:3hrs.

M.Marks:60

Note: There are two parts in paper: PART I and PART II. PART I consist of ten questions (2 marks each) and all are compulsory. Part II contains six questions (10 marks each) from which students have to attempt any four questions.

Q1.

a) State Bresenham's line drawing principle. What are the advantages of this algorithm over DDA?

b) Distinguish between shearing and scaling 2D transformation with example.

c) How can you determine the point P(x,y) lies left or right to a segment joining the points A(x1 , y1) and N(x2, y2) ?

d) What is the rate of accessing a 1024x 1024 frame buffer with an average access rate per pixel of 300 nanoseconds on a RGB colour display?

e) Derive the equation of rotation for a point P(x,y,z) in 3-dimensional coordinate system .

f) Briefly discuss the utility of BSP tree method.

g) Write benefits and shortcomings of Z- buffer method. Three each.

h) Which function can be used to find out the resolution of CRT displays?

i) What is difference between image space and object space approach for hidden surface removal (any two).

j) List the various multimedia file formats.

PART II

Q2. Explain the Sutherland Hodgeman algorithm with example illustrations. Find a normalised transformation that maps a window whose lower left corner is at (1,1)and upper right corner is at (3,7) on to

a) A viewport that is the entire normalised device screen

b) A viewport that has the lower left corner at (1/2,1/2) and upper right corner at (3 , 3).

Q3. Explain the different types of authoring tools used for multimedia project.

Q4. Derive the equation for decision parameter of next pixel position along the elliptical path taking the starting point as $(x_{inintial}, y_{inintial})=(0,-b)$ using Bresenham's algorithm.

Q5. Compare and contrast between the following:

a) Random vs. Raster Scan
b) Illumination vs. Shading

Q6. Find a normalised transformation that maps a window whose lower left corner is at (1,2)and upper right corner is at (5,7) on to

a) A viewport that is the entire normalised device screen
b) A viewport that has the lower left corner at (3/4,3/4) and upper right corner at (3, 3).

Q7. Write short note on following:

a) Phong model
b) Homogenous coordinate transformation
c) 2D graphics pipeline
d) 8-connected boundary fill algorithm (2.5 each)