JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATIONS-2022

B.Tech-V Semester (CS/IT)

COURSE CODE (CREDITS): 18B11CI515 (3) MAX. MARKS: 15

COURSE NAME: Computer Graphics

COURSE INSTRUCTORS: Dr. Yugal Kumar, Dr. Himanshu, MAX. TIME: 1 Hour
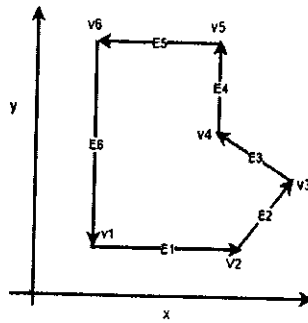
Mr. Prateek Thakral, Dr Shubham Goyal

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q.1 [CO1]
a) Suppose, a system with an 10 inch by 14 inch video screen that can display 120 pixels per inch. If, color lookup table with 256 positions is used with this system. What is the smallest possible size (in bytes) for the frame buffer? (1+1+1+1)

b) How much time is spent scanning across each row of pixels during screen refresh on a raster system with a resolution of 1680 by 1050 and refresh rate of 30 frames per second.

c) A frame buffer array is addressed in column-major order for a monitor with pixel locations starting from (5, 6) and ending with (120, 150). What is address of the pixel (30, 45)? Assume one bit storage per pixel and starting pixel location is at 120.

d) How the refresh rate is described. Suppose, we have given a refresh rate of 60 Hz. Justify it.

Q.2 [CO1]
a) For a list of N vertices, how many quadrilaterals can be obtained? What is the difference between triangle, triangle_strip and triangle_fan? (1+1+1+1)

b) How many types of projections are defined in OpenGL. Which type of the projection is used to describe the realistic scenes and objects on the screen?

c) Distinguish the delta-delta and inline configurations of masking technique.

d) Why two types of coil are used inside the CRT. Discuss the significance of each coil?

Q.3 [CO2]
a) Suppose, you are designed a circle design algorithm for plotting the circle. But, this algorithm is cost extensive in terms of calculations and computations. How you will make your algorithm more efficient? Discuss in details. (2+1+1)

b) What is the eccentric angle? Discuss it with the help of diagram and also highlights the significance and need of this angle in detail.

c) How to design the parallel Bresenham algorithm for the slope greater than 1.0?

Q.4 [CO2]
Consider the following polygon to determine the vertex table, edge table and surface facet table. (1)
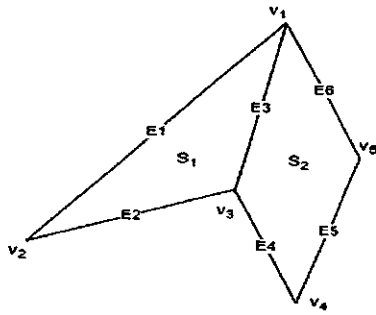
Q.5[CO2]   Consider the following polygon and the edges {E1=(1,0,0), E2=(1,1,0), E3=(1,-1,0), E4=(0,2,0), E5=(-3,0,0), E6=(0,-2,0)}. Is given polygon considered by the graphic system or not? Justify your answer with appropriate evidence. (2)

(2)