JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS-2022

B.Tech-V Semester (CS/IT)

COURSE CODE (CREDITS): 18B11CI515 (3) MAX. MARKS: 35

COURSE NAME: Computer Graphics

COURSE INSTRUCTORS: Dr. Yugal Kumar, Dr. Himanshu, MAX. TIME: 2 Hour

Mr. Prateek Thakral, Dr Shubham Goyal

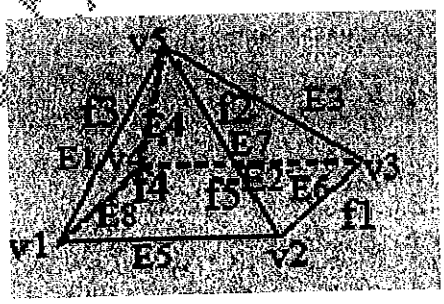
Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q.1 a. Consider a situation in which an object (x_o, y_o, z_o) is to rotate about an axis that is not parallel to one of the coordinate axes. Is this situation possible? Justify your answer with suitable explanation and procedure. (3x3=9)

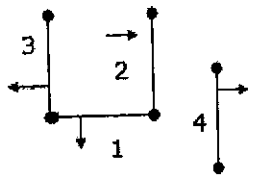
b. Suppose, three scaling parameters S_1, S_2 and S_3 are described along orthogonal directions with respect to a fixed point (X_f, Y_f, Z_f). Justify the above statement with suitable example and proper explanation?

c. A point (X_w, Y_w, Z_w) in a world coordinate system is mapped to eye space coordinate system (X_e, Y_e, Z_e). How you will determine the relative positions of the point using the pipeline procedure?

Q.2 a. Consider the following solid object for determine the B-Rep Graph and illustrate it. (2x4=8)



b. Construct the BSP tree for the following diagram?

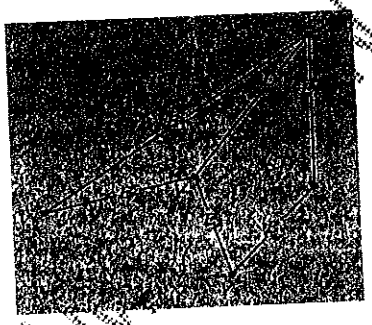


Q.3 a) Suppose, you have three choices-Linag Barsky, Cohen Sutherland and NLN for clipping the line segment. Which choice you will pick for performing the line clipping and why? Is it cost sensitive? If yes, highlight the impact on line clipping. Otherwise, justify your answer. (3x4= 12)

b) Suppose you want to perform completely inside and outside test for clipping the object. Describe the scenarios in which aforementioned test should be either applicable or not applicable. Justify your answer with proper proof.

c) Suppose, the super sampling technique can be adopted with a straight line. How you can determine the intensity level for the straight line? Further, an antialiasing can be performed on the same, determine the significance of the intensity level.

Q.4 a) Consider the following figure to determine the vertex table, edge table and facet table. (2x3=6)



b) Suppose, you want to design a circle drawing algorithm using the below mentioned diagram and your algorithm should less computationally expensive. How you will make the circle designing algorithm by considering the following diagram and also justify its integration?