Computer Graphics

Dec 2014

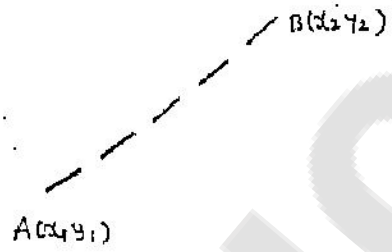
QP Code : 17882

(3 Hours) Total Marks : 100

N. B. : (1) Question No.1 Compulsory.
(2) Attempt any four questions from Q.2 to Q.7.
(3) Assume suitable data wherever its is required and clearly state it.
(4) Usae of scientific calculator is allowed.

1. (a) What are the fundamental steps in Digital Image Processing? Explain in brief. 10
(b) Explain koch curve? 5
(c) What is viewing pipeline? Explain the blocks of viewing pipeline. 5

2 (a) Derive a Digitial Differential Line Drawing Algorithm to draw straight dash line of positive value of slope as given below. 7



(b) What are the properties of concatenation of transformations? What is the sequence of transformation required to change the position of object in figure-1 to figure-2. 8

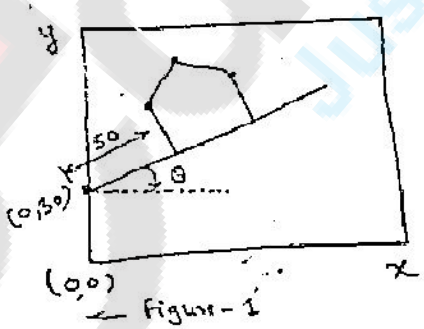


Figure - 1

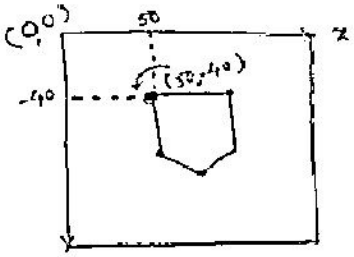
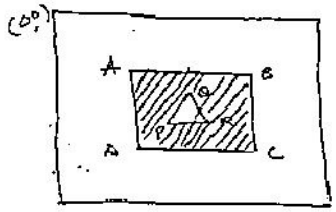


Figure - 2

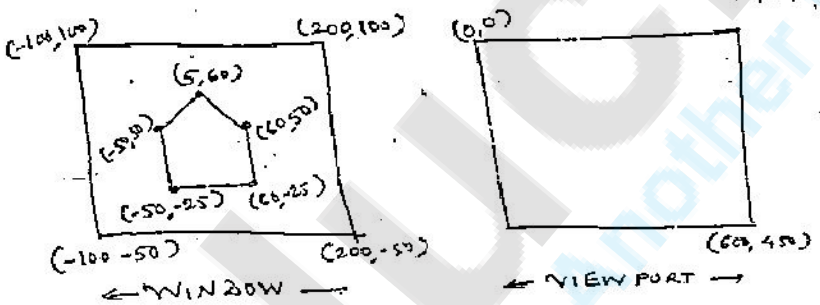
3 (a) Derive Liang Barsky Line Clipping Algorithm. 7

(b) Develop scanline polygon filling Algorithm. Explain the working of your algorithm for the following picture. Triangle PQR is cut out form the rectangle ABCD. Fill colour for Rectangle ABCD is BLACK and for triangle PQR is WHITE. 8



4 (a) Derive two dimensional Rotational Transformation Matrix. 7

(b) Figure given below depicts a picture in the window.For the viewport shown along side evaluate and draw the mapped picture. 8



5 (a) Explain Halftoning and Dithering technique 7

(b) Derive Perspective Projection Transformation of any point p (x, y, z) on to the xy plane with center of projection cop (x_p, y_p, z_p) 8

6 (a) Derive the sharpening second order derivative Laplacian mask in image enhancement. 7

(b) For the following four bit image perform the following operations. 8

(1) Threshold T =8

(2) Intensity level slicing with background a = 6 and b = 12

(3) Median filtering only at center location Remaining value no change

(4) Negation

$$F = \begin{bmatrix} 2 & 13 & 4 \\ 15 & 6 & 12 \\ 0 & 9 & 3 \end{bmatrix}$$

7 (a) Write short note on Animation in computer Graphics. 7

(b) Derive the midpoint circle Algorithm. 8