

C.U.SHAH UNIVERSITY

Summer Examination-2016

Subject Name : Computer Graphics

Subject Code : 4TE06CGR1

Branch: B.Tech (CE)

Semester : 6

Date: 06/05/2016

Time : 2:30 To 5:30

Marks : 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1

Attempt the following questions:

- | | | |
|-----------|---|----------|
| a) | Higher persistence phosphorus needs which type of refresh rate?
(a) Medium (b) Higher (c) Lower (d) None of these | 1 |
| b) | Which colors are produced in beam penetration method?
(a) Red, Green, Blue, White (b) Green, Red, White, Orange (c) Red, Green, Blue (d) Red, Orange, Yellow, Green | 1 |
| c) | Due to the presence of which element in DVST refreshing is not needed?
(a) Primary gun (b) Focusing anode (c) Flood gun (d) Control grid | 1 |
| d) | In which transformation the dimensions of an object are changed relative to a specified fixed point?
(a) Rotation (b) Reflection (c) Translation (d) Scaling | 1 |
| e) | (5,4) is a point on a circle that has center at the origin. Which of the following points are also on circle?
(a) (5,-4) (b) (-5,4) (c) (-4,-5) (d) All of above | 1 |
| f) | Suppose an RGB raster system is to be designed using an 8-inch by 10-inch screen with a resolution of 100 pixels per inch in each direction. If we want to store 6 bit per pixel in the frame buffer, how much storage (in bytes) do we need for the frame buffer?
(a) 486KB (b) 800KB (c) 4860KB (d) 10000KB | 1 |
| g) | If the most significant bit of the region code of a point (X,Y) is '1', then?
(a) $Y > YW_{MIN}$ (b) $Y > YW_{MAX}$ (c) $Y < YW_{MAX}$ (d) $Y < YW_{MIN}$ | 1 |
| h) | The region against which an object is clipped is known as?
(a) Clip window (b) Boundary (c) Enclosing rectangle (d) Clip square | 1 |
| i) | CMY model is used for
(a) Computer display (b) Printing (c) Painting (d) None of these | 1 |
| j) | What is the dimension of White color in Cartesian Co-ordinate system of RGB color model?
(a) (1,1,0) (b) (1,0,1) (c) (0,0,0) (d) (1,1,1) | 1 |
| k) | What is Vanishing point? | 1 |
| l) | What is Aspect ratio? | 1 |
| m) | Enlist applications of flat panel display. | 1 |
| n) | What is the matrix of reflection for $y = -x$? | 1 |



Attempt any four questions from Q-2 to Q-8

- Q-2 Attempt all questions**
- (a) Explain Seed filling for Polygon. 7
 - (b) What is aliasing? Briefly explain anti-aliasing techniques. 7
- Q-3 Attempt all questions**
- (a) Derive all necessary formulas for Midpoint Ellipse drawing algorithm. Write pseudo code for Midpoint Ellipse drawing algorithm. 7
 - (b) Briefly explain Polygon with its sub types. Discuss the Polygon Inside test. 7
- Q-4 Attempt all questions**
- (a) Explain various character generation methods. 7
 - (b) Calculate the pixel position along circle path with radius $r = 10$ centered on the (2,2) using midpoint circle algorithm up to $x=y$. 7
- Q-5 Attempt all questions**
- (a) Prove that the multiplication of 2D transformation matrices for each of the following sequence of operations is commutative 7
1. Two successive rotations. 2. Two successive translations.
 - (b) What is shear? Explain its types. Derive the matrix for shearing regarding any reference point. 7
- Q-6 Attempt all questions**
- (a) What is polygon clipping? Explain Sutherland Hodgeman polygon clipping algorithm with the help of example. Discuss about its limitation. 7
 - (b) Write the algorithm of Liang Barsky line clipping method. And clip the line PQ having coordinates P(-5,3) and Q(15,9) against the clip window having vertices A(0,0) , B(10,0) , C(10,10) and D(0,10) using Liang Barsky line clipping method. 7
- Q-7 Attempt all questions**
- (a) What is reflection? Explain 3D reflection. 7
 - (b) Briefly explain Z-buffer visible surface determination algorithm. 4
 - (c) Briefly explain RGB color model. 3
- Q-8 Attempt all questions**
- (a) What is projection? Explain the parallel projection techniques to project 3D object onto 2D view plane. 7
 - (b) Explain Window to View port transformation with suitable example. 7

