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SF-8370

B. E. III (Sem. VI) (IT) Examination

May / June – 2011

Computer Graphics

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. 3 (Sem. 6) (IT)**

Name of the Subject :

☛ **Computer Graphics**

☛ Subject Code No. : **8 3 7 0** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Answer the two sections in separate answer books.
(3) Figures to extreme right indicate maximum marks.
(4) Make necessary assumptions and clearly mention them, if required.
(5) Support your answers with block diagram or neat sketches, if required.

SECTION - I

1 (a) Attempt the following questions : **10**

(i) What is resolution ? Explain with example.
(ii) How to store data in random scan display ?
(iii) What is DVST ? What is its use ?
(iv) Define joysticks.
(v) Give some name of software standards.
(vi) What is anti-aliasing method ? List out some method which produces anti aliasing effect.
(vii) Discuss different output primitives.
(viii) Define scaling.
(ix) Define viewport.
(x) If we take scaling factor less than 1 then it is zoom out process (true/false)

(b) Suppose A RGB raster system it to be designed using 8inchX10 inch screen, with the resolution of 100 pixel/inch, in each direction. If we want to store 6 bits/pixels in the frame buffer then how much storage (in bytes) do we need frame buffer ? **3**

(c) Explain boundary fill algorithm. **5**

2 Attempt any four : **16**

(1) A triangle with coordinates A(2,3), B(8,3) &C(5,7) is shifted by 3 in y direction and then scaled by 2 in x direction about point(4,6). Find the new coordinates of triangle.

(2) Derive 2D transformation matrix for zoom-in and zoom-out operation.

(3) Give the difference between DDA and Bresenham's line drawing algorithm.

(4) Discuss raster scan system.

(5) Discuss odd-even parity bit method.

3 Answer the following : **16**

(a) Explain Liang Barsky line clipping algorithm in detail. **8**

OR

(a) Explain Cohen Sutherland line clipping algorithm in detail. **8**

(b) Calculate the midpoint ellipse with $r_x = 8$ and $r_y = 6$. **6**

(c) Write a shortnote on 2D translation. **2**

SECTION - II

4 (a) Answer the following : **10**

(1) Derive the condition for cavalier and cabinet projection. **3**

(2) Give 3D transformation matrix for rotation about x-axis. **2**

(3) Explain perspective projection. **2**

(4) Explain diffuse reflection. **3**

(b) Derive the 3D rotation about an axis parallel to any one of the co-ordinate axis. **10**

5 (a) Derive the blending function for bezier curve and also derive the condition for c0, c1 and G0 and G1 continuity. **10**

OR

(a) Given P0(1,1), p1(2,3), p2(4,3) and p3(6,4) the vertices of bezier polygon. Determine the points on the Bezier. Curve for t = 0, 1 / 4, 1 / 2, 3 / 4, 1. **10**

(b) Explain xyz color model. **5**

6 Answer the following : (any **three**) **15**

(1) Derive the transformation matrix for parallel projection onto xy plane.

(2) Explain z-buffer algorithm.

(3) Explain 3D reflection in arbitrary plan.

(4) Explain RGB color model.