7E4241

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B.Tech. VII Semester (Main/Back) Examination - 2013
Computer Engg.
7CS5 Computer Graphics & Multimedia Techniques
Common to CS & IT

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from each **unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)*

Unit - I

1. a) Explain the functions of display processor in raster scan display. Compare the merits and demerits of raster and vector devices **(10)**

    b) Explain the methods (any two) for producing color displays with the help of suitable diagrams **(6)**

OR

1. a) What is scan conversion? What are the major adverse side effects of scan conversion? **(4)**

    b) Show why the point-to-line error is always $\leq \frac{1}{2}$ for the midpoint line scan-conversion algorithm **(4)**

    c) What steps are required to scan convert a circle using bresenham's algorithm. Also, Derive the equation of decision variable with the help of neat diagram **(8)**

Unit - II

2. a) Use Cohen-Sutherland line clipping algorithm to find the visible portion of the line P(40,80), Q(120,30) inside the window, the window is defined as ABCD: A(20,20), B(60,20), C(60,40) and D(20,40) **(8)**

    b) What is homogeneous coordinate? Discuss the composite transformation matrices for two successive translation and scaling. **(8)**

OR

2. a) Reflect the triangle $\triangle ABC$ about the line 3x-4y+8=0. The position vector of the coordinate ABC is given as A(4,1), B(5,2) and C(4,3) **(10)**

   b) Clip the given polygon using Sutherland. Hodgeman algorithm. The polygon is defined using set of vertices {A, B,C,D,E,F,G,H}. What will be the new set of vertices after clipping, show through a diagram. **(6)**
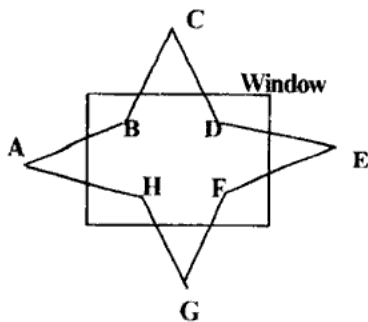
Unit - III

3. a) Prove that "The Sum of blending functions is unity for every value of parameter in Bezier curves". rtuonline.com **(6)**

   b) Differentiate between image space and object space methods **(5)**

   c) Differentiate B-Splines with Bezier curves **(5)**

OR

3. (a) A cubic bezier curve segment is described by control points P_0 (2,2), P_1(4,8), P_2(8,8) and P_3(9,5). Another curve segment is described by q_0(a,b), q_1(c,2), q_2(15,2) and q_3 (18,2). Determine the values of a,b and c so that the two curve segments Join smoothly. **(6)**

   (b) Explain Depth-Buffer method for visible surface detection. How is it different from scan-line method of visible surface detection? **(10)**

Unit - IV

4. a) Explain Gouraud shading and compare it with phong shading **(8)**

   b) Explain in brief about RGB, CMY and HSV color models. **(8)**

OR

4. (a) Explain how to simulate reflections from surfaces of different roughness using a reflection map. **(8)**

   (b) Write short note on simple recursive ray tracing without antialiasing **(8)**

Unit - V

5. a) Explain the followings:-

     i) SCSI

     ii) MIDI   **(8)**

  b) Explain the TIFF file format with its merits and demerits   **(8)**

OR

5. a) What do you mean by frame rate and pixel depth in digital video?   **(4)**

  b) Write short notes on:-

     i) Animation Techniques

     ii) Multimedia storage technologies   **(12)**