Name : ……………………………………………………………

Roll No. : …………………………………………………………

Invigilator's Signature : ………………………………………

CS/B.TECH (CSE)/SEM-6/CS-603/2011

2011

COMPUTER GRAPHICS AND MULTIMEDIA

Time Allotted : 3 Hours   *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words
as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

    i) Resolution can be defined by

        a) No. of componen

        b) No. of small square boxes

        c) No. of p xels

        d) No of pixels per unit length.

    ii) The slope of the cubic Bezier curve at the start of the
         curv is controlled by

        a) first control point

        b) first two control points

        c) first three control points

        d) all four control points.

    iii) A projection in which all three foreshortening factors are
          kept equal is called as

        a) Isometric projection

        b) Diametric projection

        c) Trimetric projection

        d) None of these.

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iv) The technique of using a minimum number of intensity levels to obtain increased visual resolution is

    a)   Dithering   b)   Depth-Cueing

    c)   Half-toning   d)   Rendering.

v) Under a parallel projection, the point (2, 3, -1) has been viewed at (3, 3, 0); then the direction of projection should be the vector

    a)   (1, 0, 1)   b)   (0, 1, 1)

    c)   (1, 0, –1)   d)   (0, –1, 1)

vi) The video memory that is used to hold the image displayed on screen is known as

    a)   Display processor   b)   LUT

    c)   Frame buffer   d)   Display file.

vii) The animator creates the usion of smooth motion by

    a)   onion skinning   b)   masking

    c)   tweening   d)   color cycling.

viii) In Bresenham's circle algorithm, if points are generated from $90°$ to $45°$ and (x, y) are the coordinate of last scene converted pixel then the next pixel coordinate is

    a)   ($x + 1, y$ 1) or ($x - 1, y - 1$)

    b)   (x , y) or ($x, y + 1$)

)   ($x + y + 1$) or ($x + 1, y - 1$)

    d)   ($x - 1, y$) or ($x + 1, y - 1$).

ix) The maximum number of dots that can be displayed without overlap on CRT is referred to as

    a)   refresh rate   b)   interlacing

    c)   screen resolution   d)   none of these.

x) Entropy encoding is

    a)   Run length encoding   b)   Lossless encoding

    c)   Lossy encoding   d)   Both (b) & (c).

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GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Distinguish between view port and window. Describe normalization transformation.

3. Perform a $30°$ rotation of a triangle A (2, 2), B (3, 3), C (6, 5) about
   a) the origin
   b) a point P (–8, –5).   2 + 3

4. What do you mean by animation ? Explain different techniques of animation. What is the difference between shape tweening and motion tweening ?   1 + 2 + 2

5. Find the equation of a Bezier curve that passes through the end points P_1 (0, 0) and P_4 (2 1) and is controlled by intermediate points P_2 (7, 5) a d P_3 (2, 0).

6. Is the flood fill algorithm suitable for filling large polygons ? If not why ? Can you sugg st a remedy ?   3 + 2

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Derive Bresenham's line drawing algorithm. Discuss its advantages over DDA.
   b) Using mid-point circle drawing algorithm, draw a circle with radius of 8 units, along the circle octant in the 1st quadrant from $x = 0$ to $x = y$ 6 + 2 + 7

8. a) What do you mean by B-spline curves ? Discuss the properties of B-spline curves.
   b) With regards to B-spline curves what is the difference between uniform and non-uniform B-spline ?

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   c)   Why do we use parametric representations of curves ?
           Why do we require the first and second order
           continuities in a curve ?   (2 + 4) + 4 + 2 + 3

9. a)   What do you mean by lossless and lossy compression ?

    b)   What do you mean by morphing ?

    c)   What are hypertext and hypermedia ? What is
          the relation between multimedia, hypertext and
          hypermedia ?

    d)   What do you mean by I-frame, B-frame and P-frame in
          the context of video compression ?

    e)   What do you mean by masking ?

                        2 + 2 + 2 + 1 + 1 + 2 + 3 + 2

10. a)   Write in brief Cohen-Sutherland line clipping algorithm.
          Discuss the drawback of th algorithm.

    b)   Write the Sutherland-Hodgeman algorithm to clip a
          polygon.

    c)   Use the Cohen-Suthe land out code algorithm to clip
          two lines P_1 (40, 15) – P_2 (75·45) and
          P_3 (70·20) – P_4 (100, 10) against a window A (50, 10),
          B (80 10). C (80, 40) and D (50, 40).

                        (4 + 2) + 3 + 6

11. Write short notes on any *three* of the following :   3 × 5

    a)   Flat Panel Display

    b)   Virtual Reality

    c)   Phong's Shading Model

    d)   Painter Algorithm

    e)   Anti-Aliasing