Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PCCS 4401A

Seventh Semester Examination – 2011

COMPUTER GRAPHICS

Full Marks – 70

Time : 3 - Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

   (a) Write the difference between bitmap and pixel map.

   (b) What do you mean by aspect ratio? Write some international standard aspect ratios?

   (c) What is match-band effect in shading?

   (d) What is the advantage of representing a point in homogeneous coordinate system?

   (e) What is a parametric curve, explain with an example.

   (f) What is the need of special purpose graphical processor?

   (g) Write the limitations of line draw algorithm.

   (h) What are the tests to ascertain a polygon P obscures polygon Q?

   (i) Write the difference between the Flood-fill and Boundary-fill algorithms

   (j) How the geometric continuity different from the parametric continuity?

2. (a) What is the difference between image processing and computer graphics? 2

   (b) Explain the technique used in CRT with the required diagram. 4

   (c) Illustrate the Bresenham's line drawing algorithm. 4

3. (a) Is it possible to draw a circle using the equation of the circle? Justify your answer. 2

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(b) Write the circle draw algorithm using Mid-point approach. 4

(c) Using the above approach scan convert the points of the 1st octant for the circle with radius 10 and center at (15, 20). 4

4. (a) Explain the following 2D transformations in the homogeneous coordinate; rotation, scaling, shearing. 5

(b) Perform a 30° anti-clock rotation to the polygon having vertices P1(10,12), P2(20,12), P3(25,16), P4(15,21), P5(5,16) about the point P1. 5

5. (a) What is point clipping ? Write the Cohen-Sutherland algorithm for line clipping. 5

(b) Using the above approach clip the line (20, 45) and (60, 74) by the clipping window (42, 48) and (70, 80). 5

6. (a) Write the equation of the Bezier curve, draw the Bezier curve using the set of control points (1,2),(4,5),(7,7),(9,3) and test the order of continuity. 5

(b) What is projection ? Derive the transformation for the parallel and perspective projection. 5

7. (a) Distinguish between the image and object space approach for visible surface detection. 2

(b) Write the depth buffer algorithm for hidden surface removal. 4

(c) Write objectives of MPEG, discuss how the I-frame, P-frames, and B-frames useful in video compression. 4

8. Write notes on any *four* of the followings : 2.5×4

(i) WCS vs VCS

(ii) Half-toning

(iii) Phong shading

(iv) Frame buffer

(v) Zooming and Panning