Total No. of Questions : 8]

[Total No. of Printed Pages : 2

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CS-5004 (CBGS)

B.E. V Semester

Examination, November 2018

Choice Based Grading System (CBGS)

Computer Graphics and Multimedia

Time : Three Hours

Maximum Marks : 70

Note: i)   Attempt any five questions.

ii) All questions carry equal marks.

1. a) Discuss some of the application areas in which computer graphics is used. Write the two methods used for displaying colour pictures on CRT monitors.

   b) Use Bresenham's algorithm to check whether pixel position (28, 16) needs to be plotted or not while drawing a line from point (20,10) to (30, 18).

2. a) Explain briefly the role of computer graphics in movies and cartoon films. Find the refresh rate of a 512×512 frame buffer, if the access time for each pixel is 200 nanoseconds.

   b) Explain any line clipping algorithm against a boundary with suitable example.

3. a) Briefly mention the audio digitization procedure.

   b) Show that transformation matrix for a reflection about line $y = x$, is equivalent to a reflection relative to the y-axis followed by a counter clockwise rotation of 90°.

[2]

4. a) Derive expression for converting RGB colour parameter to HSV values?

   b) Write down the steps in designing animation sequences.

5. a) Construct a uniform B-spline curve of third order with four polygon vertices P(1, 1), Q(2,3), R(4,3) and S(6,4).

   b) Write down the method for simulating acceleration in computer graphics.

6. a) Find the points on Bezier curve which has starting and ending points P0(2,3) and P3(4,−3) respectively and is controlled by P1(6,6) and P2(8,1) for u=0.2, 0.5 and 0.9.

   b) Define fractal dimension. Discuss various continuity conditions at the joining of curves.

7. a) Discuss depth buffer and depth sorting methods for hidden surface removal.

   b) Explain illumination model to calculate the surface intensity due to multiple sources of light.

8. a) A solid tetrahedron is given by position vectors A(1, 1, 1), B(3, 1, 1), C(2, 1, 3) and D(2, 2, 2) and a point light is kept at P(2, 3, 4). Using back face detection method find the surface on which the light falls and the surfaces which are to be shadowed.

   b) Explain the perspective projections with suitable diagrams and write transformation matrix for them.

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