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MCS-053

MCA (Revised)

Term-End Examination

December, 2012

11315

MCS-053 : COMPUTER GRAPHICS AND MULTIMEDIA

Time : 3 hours *Maximum Marks : **100***

*Note : Question number **1** is **compulsory**. Attempt **any three** questions from the rest.*

1. (a) What is frame buffer ? In a 600×400 pixel, how many bytes does a frame buffer need ? Explain your answer. 5

   (b) Differentiate between scan line polygon fill and flood fill algorithm. 5

   (c) What is vanishing point ? Explain principle vanishing point with respect to Z-axis with the help of a suitable diagram. 5

   (d) Prove that two 2D rotation about the origin is commutative i.e., $R_1, R_2 = R_2 R_1$. 5

   (e) Prove the following for Bezier curve : 5

   (i) $P'(u=0) = n(P_1 - P_0)$

   (ii) $P'(u=1) = n(P_n - P_{n-1})$

   (f) Explain, with the help of suitable diagram, how the Z-Buffer algorithm determine which surfaces are visible ? 5

(g) What is file compression? What is the Need of video compression ? Explain any two video file formats. 5

(h) Explain the process of simulating motion using zero acceleration with the help of diagram. 5

2. (a) Explain all the four cases of Sutherland Hodge-man polygon clipping algorithm using a diagram. 6

(b) Obtain the transformation matrix for mirror reflection respect to the line $Y = 5x$. 6

(c) Write Bresenham's circle generation algorithm . Compute coordinates of points of circle drawn with center at (0,0) and radius 8 using Bresenham's circle generation algorithm. 8

3. (a) Explain the basic Ray Tracing Algorithm with the help of a diagram. 6

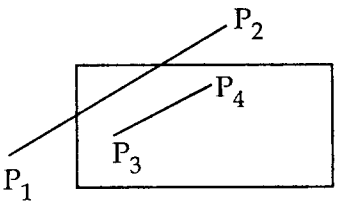
(b) Draw a line from (6, 3) to (16, 10) using DDA line drawing algorithm. What are the disadvantages of using this algorithm? 7

(c) Give the composite transformation matrix of a cube in 3D, if the cube is scaled, rotated about Y axis and then translated. 7

4. (a) Differentiate between parallel and perspective projections. Also gives the taxonomy at various types of parallel and perspective projection . 6

(b) Determine 5 points on Bezier curve whose control points are Po(4,2), P_1(8,8), P_2,(16,4) and P_3, (24,2). Also draw the approximate sketch of the curve. 6

(c) Using 4 bit code for nine regions, clip the lines P_1, P_2 and P_3 P_4 given below, using Cohen Sutherland line clipping algorithm. 8



5. (a) Explain the following terms: 14

(i) Cel Animation

(ii) Hyper media

(iii) Audio file Formate

(iv) Anti-aliasing

(v) Aspect Ratio

(vi) XY-Shearing 2 D Transformation.

(vii) Frame -buffer.

(b) What is morphing ? How key frames are used in Morphing ? Explain with the help of suitable diagram. 6