MCA - Sem III - CBSGS
Computer Graphics - Nov '25 '2016

QP Code: 514902

(3 Hours) **Total Marks: 80**

N.B. **(1) Question No. 1 is compulsory.**
(2) Figures to the right indicate maximum marks.
(3) Attempt any four questions from Question No 2 to 7.

Q.1 **(a)** What are projections? Explain various types of projections. **[10]**
(b) Rasterize the line whose endpoints are A(-2,5), B(-9,7) using DDA algorithm. **[05]**
(c) Find out the dynamic range of an image if all the slopes in the contrast stretched algorithm l, m, n are given as 0.2, 0.5, 0.2 respectively. The initial dynamic range of the original image is [0 - 10], a=4 and b=8. **[05]**

Q.2 **(a)** What are the properties of the curve? Derive quadratic and cubic Bezier curve. **[08]**
(b) Consider the object with coordinates A(2,4), B(3,1) C(5,3). Transform it by first reflecting it about x-axis and then rotating it by 60 deg. **[07]**

Q.3 **(a)** Write an algorithm for a midpoint circle generation. And Plot a circle centered at (10,5) having a radius of 15 units. **[08]**
(b) What is visible surface detection? Differentiate between the object space method and image space method of detecting visible surface. Explain the Depth buffer method for visible surface detection. **[07]**

Q.4 **(a)** Use Liang - Barsky line clipping algorithm to find the visible portion of the line P1(-10,50) to P2(30,80) against window **[08]**
(X_{wmin}=-3, Y_{wmin}=10) (X_{wmax}=20, Y_{wmax}=60).
(b) What is 2D viewing transformation. Derive the window to viewport transformation equation. **[07]**

Q.5 **(a)** Reflect the 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). **[08]**
(b) Explain Halftone shading technique and compare this with the Dithering technique. **[07]**

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Q.6 (a) For the following image data of 8 bits per pixels . Obtain [08]

i) Image negative

ii) Thresholding result (Threshold value = 150)

120	135	215	220	125
135	20	187	50	80
250	115	55	120	45
30	180	200	46	20
60	119	120	255	135

(b) Equalize the given histogram. [07]

Grey Level	0	1	2	3	4	5	6	7
No. of Pixels	790	1023	850	656	329	245	122	81

Q.7 Write short notes on the following (any 3) [15]

(a) Low pass Median Filter

(b) Flood Fill Algorithm

(c) Koch Curve

(d) Animation

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