

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

MCA (Sem.-5th)
COMPUTER GRAPHICS
Subject Code : MCA-501
Paper ID : [B0122]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each and students has to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY carrying TWENTY marks in all.
3. Use of non-programmable scientific calculator is allowed.

SECTION-A

1. a. Explain in detail working of shadow mask and beam penetration CRT.
Instruction and working of various hard copy devices. (5,5)

2. Describe in detail working and applications of Random Scan Systems. (10)

SECTION-B

3. a. Explain in detail Midpoint algorithm for scan converting a circle.
b. Using Midpoint circle generation algorithm, compute the coordinates of points that lie on the circumference of the circle with radius 5 and center as (7,7). (5,5)
4. Why line clipping algorithms are not used for clipping a polygon on line to line basis ? Explain in detail Sutherland-Hodgeman polygon clipping algorithm. (10)

SECTION-C

5. Find the transformation A_v which aligns a given vector V with the vector K along the positive z-axis. (10)

6. a. What are the various anomalies associated with the perspective transformations?
- b. Derive the general perspective transformation onto a plane with reference point $R_0(x_0, y_0, z_0)$, normal vector $N = n_1I + n_2J + n_3K$, using $C(a, b, c)$ as the centre of projection. (5,5)

SECTION-D

7. Explain Gourard method for shading. (10)
8. Explain in detail z-buffer method for hidden surface elimination. (10)

SECTION-E

9. **Give short answers of the followings :**

- a. What is meant by persistence?
- b. State whether the given statement is **true** or **false**: “*Fluorescence is the term used to describe the light given off by a phosphor after to an electron beam*”. Explain your answer.
- c. If a boundary is 8-connected, can 8-boundary fill algorithm be used to fill the region bounded by that boundary? If no, why?
- d. What is the relationship between the rotations R_Θ , $R_{-\Theta}$, and R_Θ^{-1} ?
- e. What are principal vanishing points?
- f. What are cavalier and cabinet projections?
- g. What is meant by diffuse and specular reflection?
- h. What is meant by coherence? Explain the type of coherence technique used in scan-line method for removing hidden surfaces.
- i. What are emissive and non-emissive displays? Give examples of each.
- j. What is meant by Halftoning?