Roll No. ....

Total No. of Questions : 09]   [Total No. of Pages : 02

B. Tech. (Sem. - 5th)
COMPUTER GRAPHICS
SUBJECT CODE : CS - 309
Paper ID : [A0468]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours   **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.

2) Attempt any **Four** questions from Section - B.

3) Attempt any **Two** questions from Section - C.

Section - A

Q1)   (10 × 2 = 20)

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 it has been exposed 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 is meant by convex hull property of Bezier curves?

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?

R-730   P.T.O.

Section - B

(4 × 5 = 20)

Q2) Why line clipping algorithms are not used for clipping a polygon on line to line basis? Explain in detail Sutherland-Hodgeman polygon clipping algorithm.

Q3) Explain in detail the use of area-based algorithms for hidden surface elimination.

Q4) Find the transformation A which aligns a given vector V with the vector K along the positive z-axis.

Q5) Explain in detail working of shadow mask and beam penetration CRT.

Q6) What is meant by window and viewport? Write a transformation matrix for mapping the contents of a window to viewport.

Section - C

(2 × 10 = 20)

Q7) (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).

Q8) (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 $N = n_1 I + n_2 J + n_3 K$, using C(a,b,c) as the centre of projection.

Q9) (a) Explain Gourard method for shading.

(b) What is meant by anti-aliasing? Explain various methods used for it.

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