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Total No. of Questions : 09

B.Tech. (3D Animation & Graphics) (2012 Onwards) (Sem.-4)

COMPUTER GRAPHICS

Subject Code : BTCS-504

Paper ID : [A2562]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students has to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students has to attempt any **TWO** questions.

SECTION-A

1. Give short answers of the following :

- If a boundary is 8-connected, can 8-boundary fill algorithm be used to fill the region bounded by that boundary? If no, why?
- What are homogenous coordinates? How would you represent a point at infinity using homogenous coordinates?
- What is meant by differential scaling?
- Differentiate between interior clipping and exterior clipping.
- Why computer generated lines which are not parallel to x-axis or y-axis and which are not inclined at $\pm 45^\circ$ to x- or y-axis appears to be zigzagged?
- What are vanishing points?
- Differentiate between object space and image space method for visible surface detection.
- What do you mean by rendering?
- Show that $S_{a,b} \cdot S_{c,d} = S_{c,d} \cdot S_{a,b} = S_{ac,bd}$.
- Find the matrix that represents rotation of an object by 30° about the origin.

SECTION-B

2. Describe in brief edge fill and fence fill algorithms.
3. Reflect a diamond-shaped polygon whose vertices are $A(-1,0)$, $B(0,-2)$, $C(1,0)$ and $D(0,2)$ about the line $y = x+2$.
4. Write short note on Gouraud and Phong shading.
5. What do you mean by window and viewport? Describe window to viewport transformation.
6. Describe a line clipping technique based on analysis of parametric equations of a line segment.

SECTION-C

7.
 - a. Explain in detail Bresenham's algorithm for scan converting a line.
 - b. Using Bresenham's line drawing algorithm, compute the coordinates of points on line between $(2,3)$ and $(7,5)$.
8. Describe in detail Weiler-Atherton polygon clipping algorithm. How it is advantageous over Sutherland-Hodgeman polygon clipping algorithm?
9. Write short notes on :
 - a. Floating horizon technique
 - b. Fractals