Printed Pages : 1

2.

B.TECH. THEORY EXAMINATION (SEM-IV) 2016-17

COMPUTER GRAPHICS

Max. Marks : 100

Note: Be precise in your answer. In case of numerical problem assume data wherever not provided.

SECTION - A

Explain the following: 1.

- Why do we need video controller? (a)
- Trace the points for drawing a line from (0,0) to (-6,-6) using simple DDA algorithm. (b)
- Define refresh buffer. (c)
- Give the transformation matrix for rotation about an arbitrary point P in space. (d)
- Prove that the two successive rotations are commutative. (e)

Roll No.

- Write how shear transformation works. (f)
- List the properties of B-spline curves.
- (g) Differentiate between specular reflection and diffuse reflection.
- (h) How a viewport differs from the window?
- (i) What do you mean by aliasing and antialiasing? Give examples (i)

SECTION - B

$5 \ge 10 = 50$

- Attempt any five parts of the following questions: Develop the Bresenham's line drawing to draw lines of any scope. Compare this with (a) the DDA Algorithm.
- Given a 25cm x 20cm display operating in 1024 x 768 x 16 color mode which is refreshed 30 times per second, and for which 10% of the refresh cycle is spent in (b) retrace, calculate
 - the pixel aspect ratio, (i)
 - the size of the frame buffer, and (ii)
 - the required data transfer rate in kilobytes per second.
- Given a window bordered by (1,2) at the lower left and (16,12) at the upper right, give the screen coordinates of a triangle with vertices (3,2), (10,7.5) and (5,5) when mapped (c) into a viewport with corners (100,100) and (400,200). Provide accurate illustrations of the window, viewport, and the untransformed and transformed triangles with your
- Explain the essential difference between the "Scan-Line" hidden surface removal (d) algorithm and the depth buffer technique.
- Write the way of clipping a line using Cohen Sutherland algorithm.
- (e) Give a detailed explanation about quadratic surfaces and polygon surfaces.
- (f) Write down the detailed description of Warn model. (g)

SECTION - C

$2 \ge 15 = 30$ Attempt any two parts of the following questions:

The figure ABCD where A=(-2,0), B=(0,-2), C=(-2,-4) and D=(-4,-2) can be transformed into A'B'C'D' where A'=(1,-1), B'=(3,3), C'=(6,3) and D'=(4,-1) by the 3 composition of simple transforms T2*H1*S1*R1*T1. Give the matrix form of these five transformations. Then express the composite transform using only one scale, one rotation and one translation.

- Explain Area Subdivision algorithm with suitable figure? List the advantages and 4 disadvantages of Area Subdivision algorithm.
- Discuss in detail about visible surface detection methods. 5

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 $10 \ge 2 = 20$