Question Paper

Exam Date & Time: 07-Jul-2023 (02:30 PM - 05:30 PM)



SIXTH SEMESTER B.TECH END SEMESTER MAKEUP EXAMINATIONS, JULY 2023

COMPUTER GRAPHICS [ICT 4033]

Α

Marks: 50

Duration: 180 mins.

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1) Perform Shearing Transformation in the given cuboid(OABCDEFG) along Z-direction if a shearing (5) parameter is as follows $S_x=2$, $S_y=3$. Write the resultant cuboid

A)



	B)	Explain graphics pipeline with all the necessary steps. Write diagrams wherever necessary	(3)
	C)	Explain 3D viewing pipeline with all the necessary steps	(2)
2)		Explain Cohen-Sutherland algorithm for 3D clipping	(5)
	A)		
	B)	Apply general scaling directions for the square A(1, 1), B(3,1), C(1,3), D(3,3) with an angle of rotation 45^0 , and scaling factors s =1 and s =2	(3)
	C)	Explain the normalized view volume to 3D screen in a perspective projection and write the matrix representation	(2)

3)		Explain CRT display with a neat diagram. Differentiate it with LED and LCD displays with respect to their functionalities and features	(5)
	A)		
	B)	Given a 3D triangle with points $(1, 1, 1)$, $(2, 2, 4)$ and $(3, 3, 4)$, apply shear parameter 2 on X axis, 3 on Y axis and 2 on Z axis and find out the new coordinates of the object	(3)
	C)	Differentiate between image space method and object space method of hidden surface removal. Describe back face detection method	(2)
4)	A)	Explain the folowing functions in OpenGL with their format and example for each: i. glutInitWindowPosition() ii. glutInitDisplayMode() iii. glClear() iv. glFlush()	(5)
	B)	Explain how the following steps can be carried out in Gouraud shading.	(3)
		i. Determine average normal unit vector	
		ii. Apply illumination model	
		iii. Interpolate vertex intensities	
	C)	Explain 3D viewing pipeline	(2)
5)		Compute the knot values for a B-spline curve with the following data. Determine the blending function of the curve on the computed knot values.	(5)
	A)	Control points=4 and degree=2	
	B)	Differentiate between LED and LCD displays with their salient features	(3)
	C)	Explain texture mapping with an example	(2)

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