## **Question Paper**

Exam Date & Time: 25-Nov-2022 (09:00 AM - 12:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

## VII SEMESTER B.TECH END SEMESTER EXAMINATIONS, NOV 2022

Computer Graphics and Animation [ICT 4301]

Ма	rks: 50	Duration:	180 mins.
		Α	
An	swer all the	questions.	
Ins	tructions to	Candidates: Answer ALL questions Missing data may be suitably assumed	
1)		Using the midpoint circle drawing algorithm, determine the points of a circle with a radius r=8.	(5)
	A)		
	B)	Draw the architecture of a raster-graphics system with a display processor. And justify the use of display processor used in this architecture.	(3)
	C)	What are articulated figures? What role does it play in animation?	(2)
2)		Determine the content of the active edge table to fill the polygon with vertices A( 2,4) B(2,7) , C(4,9) and D(4,6).	(5)
	A)		
	B)	Given a 2D triangle with coordinate points P(2, 6), Q(5, 7), R(4, 9)	(3)
		i. Apply the reflection on the Y axis and obtain the new coordinates of the object.	
		ii. Perform a counter clockwise 45 degree rotation on the above mentioned triangle. Assume the origin is at (2,2).	
	C)	Compare and contrast 3D Cavalier and Cabinet Oblique Parallel Projections.	(2)
3)		Clip the polygon in Fig. 1 using the Sutherland Hodgeman algorithm with the interpretation of every phase output.	(5)
	A)		

B) Mention advantage and disadvantage of key frame specification

В Fig. 1

Α

- (3)
- C) Apply rotation transformation to a cube shown in Fig.2, then rotate it 45 degrees anti clockwise (2) around the y-axis.



- 4) Assume radius along x-axis is  $r_x=8$  and along y-axis  $r_y=6$ , generate all points using midpoint ellipse (5) drawing algorithm for region 1.
- A) B) Derive the expression for initial decision parameter used in Bresenham's Circle algorithm. (3) Prove that  $P_k = 2\Delta y x_k - 2\Delta x y_k$  in Bresenham's line drawling algorithm. C) (2) Write a OpenGL program to draw a triangle also mention OpenGL applications. 5) (5) A) B) Prove that two Successive translation and rotation are additive in 2D transformation. (3) ABCD be the rectangle window with A(10,10), B(80,10), C(80,60) and D(10,60). Find the region C) (2)

codes for the endpoints & use Cohen Sutherland algorithm to clip the line P1P2 with P1(5,30), P2(60,80).

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