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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Midterm Examination, Spring 2026

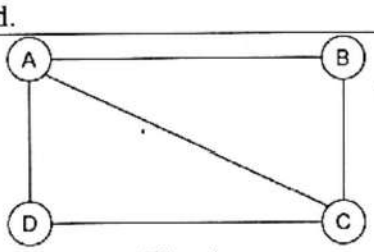
Course Code: CSE421, Course Title: Computer Graphics

Level:4 Term:3 Batch: 64

Time: 01:30 Hrs **Marks: 25**

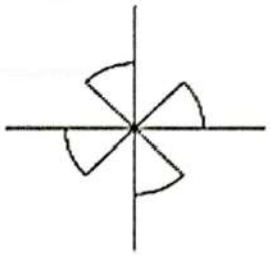
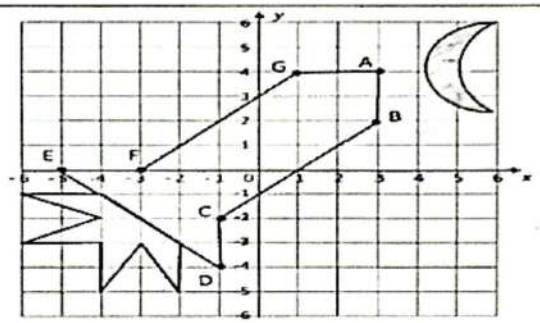
Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	***a)***	A computer graphics lab uses a display unit to show images and animations in multiple colors. The display quality depends on beam alignment and color intensity control. Different internal structures are used in similar versions of this display to improve brightness and color precision. The image must be refreshed repeatedly to remain visible. **Identify** the display device described in the scenario and compare its two types.	**[3]**	**CO1**
	b)	Explain the concept of the decision parameter in the Mid-Point Circle Drawing Algorithm and **describe** how the initial and next decision parameters are obtained.	**[5]**	
2.		 **Fig: A** A surveillance drone is mapping a restricted rectangular zone using a pixel-based coordinate system. In Figure A, four checkpoints—A, B, C, D—are placed at the corners of the zone. The drone must first trace the bottom boundary of the zone and then draw a direct flight path from the top-left checkpoint to the bottom-right checkpoint using an efficient raster line-drawing technique. Given the coordinates: A(40,50), B(55,50), C(55,40), D(40,40) (i) Draw the line CD. You can use any suitable algorithm as necessary. (ii) **Apply** Bresenham's Line Drawing Algorithm to draw the line CA.	**[6]**	**CO2**

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3		Suppose Mr. Faruk has been appointed to design a video game, where he needs to draw a fan similar to Fig. A. The fan has an outer circular boundary with a diameter of 12 and is centered at (–3, 4). Now, **Apply** the Midpoint Circle Algorithm to calculate the pixel points of the fan's circular boundary, and finally draw a tentative plot of the fan.  Fig: B	[7]	CO2
4.		 Fig: C The polygonal object ABCDEFG shown in the figure represents a 2D object drawn on the Cartesian coordinate system. a) Now translate the object 3 units to the right and 2 units upward. Write the translation matrix and **determine** the new coordinates of all vertices after translation. b)Scale the translated object obtained in part (a) using: Scaling factor Sx = 2 and Scaling factor Sy = 0.5. Write the scaling matrix and **compute** the final coordinates of the object.	[4]	CO2

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