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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science and Engineering

Midterm Examination, Spring 2025

Course Code: CSE411, Course Title: Artificial Intelligence

Level: 4 Term: 1 Batch: 61

Time: 01:30 Minutes **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.	You are given a situation on environmental monitoring system using Bio-sensor enabled swarm robots. This AI autonomous system will perform as an Intelligent agent on toxic gases, pathogens in the environment concerning with model computation time. Now, answer the following questions using this case study.			
	a)	**Discuss** PEAS using the case study of Intelligent AI.	2	CO2
	b)	**Develop** an AI system considering environment types with an agent and demonstrate it functionalities.	3	
	c)	**Explain** the state of the art of AI using problem solving agent.	3	
2.	Perform the following questions and answer each questions respectively.			
	a)	**Construct** a tree from 'A' to 'P' and apply blind search strategies using BFS, DFS, DLS, and IDS to find out solutions where start node is 'A' and goal node is 'P'. [Note: branching factor = 2, limit = 2 and depth = 4].	4	CO3
	b)	**Develop** solution on the following information, draw bidirectional graph and apply A* search and Beam search where (β=2). [Note: Goal state: 'J']	6	
	c)	**Compare** problem solving performance measure of A* and beam search.	2	
3.	**Explain** the difference between goal formulation and problem formulation and solve the following problem of 8-puzzle.		5	CO1

	A(10)	B(8)	C(5)	D(7)	E(3)	F(6)	G(5)	H(3)	I(1)	J(0)
A(10)	0	6	0	0	0	3	0	0	0	0
B(8)	6	0	3	2	0	0	0	0	0	0
C(5)	0	3	0	1	5	0	0	0	0	0
D(7)	0	2	1	0	8	0	0	0	0	0
E(3)	0	0	5	8	0	0	0	0	5	5
F(6)	3	0	0	0	0	0	1	7	0	0
G(5)	0	0	0	0	0	1	0	0	3	0
H(3)	0	0	0	0	0	7	0	0	2	0
I(1)	0	0	0	0	5	0	3	2	0	3
J(0)	0	0	0	0	5	0	0	0	3	0

State	h(n)
A	10
B	8
C	5
D	7
E	3
F	6
G	5
H	3
I	1
J	0

