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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Midterm Examination, Fall 2025
Course Code: CSE411 , Course Title: Artificial Intelligence
Level: 4 Term: T1 Batch: 62

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.		Consider an AgriBot which is an AI agent which could boost productivity, sustainability, and farmer confidence. In Greenfield County, farmers struggled with unpredictable weather and pests. The system should consider an automatic AgriBot, an AI-powered assistant. AgriBot scanned the fields, checking soil moisture, crop health, and pest activity. AgriBot will enable to eco-friendly solution on damage areas to optimized to planting schedules and increased yields.		
	a)	**Define** the PEAS of AgriBot with the diagram.	[5]	CO1
	b)	**Explain** the working model of agentic solution defining environment types with problem formulation criteria.	[5]	
2.		The city of Smart villa is designed as a grid of connected intersections. A delivery robot needs to find the shortest path from its warehouse (node A) to the delivery point (node G). The city layout and distances between intersections are as follows:	[4]	CO2

From	To	Distance (km)	h(n)
A	B, C, D	2,4,3	7
B	E	5	5
C	D,F	1,3	1
D	F	2	3
E	G	3	2
F	G	6	2
G	G	0	0

	a)	**Develop** the List and compare the order in which the nodes are expanded for the following search strategies - 1. Uniform cost search 2. Greedy best-first search 3. A* search 4. Iterative Deepening Search		

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	b)	**Explain** which algorithm found the goal faster (fewer nodes expanded). Does the heuristic used here appear to be **admissible** and **consistent**? Justify your answer.	[2]	
	c)	**Construct** solution for the following initial population, perform the three major operations of the genetic algorithm. C1: 101010 C2: 110011 C3: 100110 C4: 111000	[4]	
3.	*a)*	You are part of a research team designing an AI-powered Medical Diagnosis Expert System for rural health centers in Bangladesh. The system will assist doctors in identifying diseases such as typhoid, dengue, influenza, and malaria based on patients' symptoms, test results, and environmental conditions (e.g., temperature, rainfall patterns). **Illustrate** an Expert System by describing the structure of the knowledge base with at least two sample rules, the type of inference engine to collect and update patient data and medical records over time for diagnostic outcomes for medical staff.	[5]	CO3

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