



School of Computer Science and Engineering

Winter Semester 2022-2023 Continuous Assessment Test – I

SLOT: F2+TF2

Programme Name & Branch: B.E Computer Science & Engineering / SCOPE

Course Name & code: BCSE306L & Artificial Intelligence

Class Number (s): VL2022230504299

Faculty Name (s): Dr S Vaishnavi

Exam Duration: 90 Min.

Maximum Marks: 50

Q.No.	Question	Max Marks
1.	a) Explain in detail about any 10 applications of AI. (5 Marks) b) Explain the following (1) Model based Agent (2) Goal based agent (5 Marks)	10
2.	Trace the operation of A* search applied to the problem of getting to Bucharest from Lugoj using the straight-line distance heuristic. Show the sequence of nodes that the algorithm will consider to reach the goal. Refer the h_{SLD} as mentioned in the table below.	10

Arad	366	Mehadia	241
Bucharest	0	Neamt	234
Craiova	160	Oradea	380
Drobeta	242	Pitesti	100
Eforie	161	Rimnicu Vilcea	193
Fagaras	176	Sibiu	253
Giurgiu	77	Timisoara	329
Hirsova	151	Urziceni	80
Iasi	226	Vaslui	199
Lugoj	244	Zerind	374

3.	<p>a) Discuss the properties of task environment.(5Marks)</p> <p>b) For each of the following activities, give a PEAS description of the task environment.</p> <ul style="list-style-type: none"> · Playing soccer. · Exploring the subsurface oceans of Titan. · Shopping for used AI books on the Internet. (5Marks) 	10
4.	<p>a) Trace the Breadth First Search Algorithm for the given tree structure and Compare its performance with Depth Limited search technique. (7 Marks)</p> <div style="text-align: center;"> <pre> graph TD A((A)) --- B((B)) A --- C((C)) A --- D((D)) B --- E((E)) B --- F((F)) D --- G((G)) D --- H((H)) D --- I((I)) E --- J((J)) F --- K((K)) G --- L((L)) </pre> </div> <p>b) List out the various measures to evaluate algorithm performance.(3 Marks)</p>	10
5.	<p>Suppose two friends live in different cities on a map, such as the Romania map shown</p> <p>On every turn, we can simultaneously move each friend to a neighboring city on the map. The amount of time needed to move from city i to neighbor j is equal to the road distance $D(i, j)$ between the cities, but on each turn the friend that arrives first must wait until the other one arrives (and calls the first on his/her cell phone) before the next turn can begin. We want the two friends to meet as quickly as possible.</p> <p>a. Write a detailed formulation for this search problem. (You will find it helpful to define some formal notation here.)</p> <p>b. Let $D(i, j)$ be the straight-line distance between cities i and j. Which of the following heuristic functions are admissible? (i) $D(i, j)$; (ii) $2 \cdot D(i, j)$; (iii) $D(i, j)/2$.</p> <p>c. Are there completely connected maps for which no solution exists?</p> <p>d. Are there maps in which all solutions require one friend to visit the same city twice?</p>	10