VIT
Vellore Institute of Technology

Reg.Number

Continuous Assessment Test II– APR 2024

Programme	: **B. Tech (CSE with Specialization)**	Semester	:	**Winter 23-24**	
Course Code & Course Title	: **BCSE306L, Artificial Intelligence**	Slot	:	**C2+TC2**	
Faculty (s)	: **Dr. Vergin Raja Sarobin M, Dr. Vijayalakshmi, Dr. Rajesh Kumar, Dr. Vedhapriyavadhana, Dr. Tamilarasi, Dr. Abirami S, Dr. Krithiga R, Dr. Reena Roy, Dr. Vijayaprabakaran, Dr. Christopher Columbus, Dr. Lakshmi Harika P, Dr. Poonkodi, Dr. Prem Sankar**	Class Nbr(s)	:	CH2023240501390, 1394, 1424, 1416, 1418, 1420, 1398, 1422, 1401, 1403, 1406, 1414, 1429	
Time	: **1 ½ Hours**	Max. Marks	:	**50**	

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information.
- Only non-programmable calculator without storage is permitted

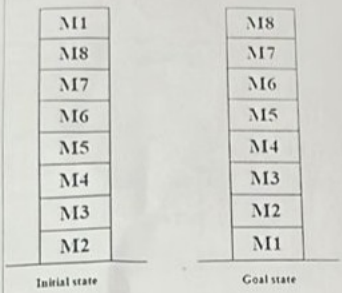
Answer ALL Questions

Q.No	Question Description	Marks
1.	How will Bob emerge victorious if Bob has to make the next move if there is a friendly game of Tic-Tac-Toe between Alice(X move - Max) and Bob (0 move - Min). They both intend to outsmart each other and secure a win. With a provided intermediate state, they are making their moves, their proficiency in the Minimax Algorithm will be key in determining the outcome.	10

X		O
X	O	

2. A Factory has decided to optimize the layout of machines on the factory floor to reduce the total distance traveled by workers during production. The factory floor is depicted as a grid, with each cell representing a potential machine location. The factory consists of 8 floors, each with one machine initially placed. The diagram illustrates the initial machine arrangement. Rearrange the machines so that each is on its respective floor as shown in goal state. You can perform two operations: i) Move one machine to the ground floor open area, and ii) move one machine onto another. Apply both local and global heuristics

approaches to determine the best placement. Justify your solution and determine which heuristic yields superior results.



3	Suppose a genetic algorithm uses chromosomes of the form x = abcdef with a fixed length of six genes. Each gene can be any digit between 0 and 9. Let the fitness of individual x be calculated as f(x) = (a + b) − (c + d) + (e + f), and let the initial population consist of four individuals with the following chromosomes: x1 = 5 2 4 6 4 3 x2 = 9 8 2 3 7 7 x3 = 3 4 2 3 9 6 x4 = 2 9 6 3 1 8 a) Evaluate the fitness of each individual by showing all your workings. (3 Marks) b) Find the average fitness value for all individuals (2 Marks) c) Perform the selection, crossover, mutation operations (5 Marks)	10
4	Consider the following facts: a) Team India b) Team West Indies c) Semi-Final match between India and West Indies. d) India scored 250 runs, West Indies scored 250 runs, India lost 5 wickets,West Indies lost 7 wickets. e) The team which scored the maximum run wins. f) If the scores are same,the team which lost minimum wickets win the match. **Represent the facts in** **i)Predicate logic, Convert to clause form(10 M)** **ii)Prove by resolution "India wins the match"(5 M)**	15