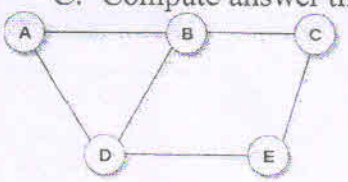
SOMAIYA VIDYAVIHAR UNIVERSITY

14-05-2024(E)

Semester: January 2024 –April 2024 **Maximum Marks: 100** **Examination: ESE Examination** **Duration:3 Hrs.**		
Programme code: 01 **Programme: Btech Computer Engineering**	**Class:** TY	**Semester: VI(SVU 2020)**
Name of the Constituent College: **K. J. Somaiya College of Engineering**	**Name of the department: Computer**	
Course Code: 116U01C603 **Name of the Course: Artificial Intelligence**		
Instructions: 1)Draw neat diagrams 2) All questions are compulsory **3) Assume suitable data wherever necessary**		

Que. No.	Question	Max. Marks
Q1	Solve any **Four**	**20**
i)	What are basic components of Intelligent systems?	5
ii)	Discuss and state the limitation of "**Thinking rationally approach of AI**"	5
iii)	Explain PEAS for automated driving scenario.	5
iv)	Discuss any two applications of AI.	5
v)	What is the advantage of Expert systems?	5
vi)	Give action description for wearing socks and shoes using ADL- Action Description Language.	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	**10**
i)	When to use Bayesian Networks? Draw topology and conditional probability table for grass being wet in the event of : a. Sprinkler being on, or b. It is raining or c. Sprinkler being on and it is raining, both. Assume suitable data	5
ii)	Compare and contrast between A* and AO* search algorithm, give a suitable example to support your answer.	5
	OR	
Q2 A	The goal here is to assign each letter a digit from 0 to 9 so that the arithmetic works out correctly. The rules are that all occurrences of a letter must be assigned the same digit, and no digit can be assigned to more than one letter. Use Constraint Satisfaction Problem with backtracking (CSP) to: A. Solve the given instance of crypt-arithmetic problem. B. State constraints clearly C. State heuristic chosen to solve the problem. D. Show step by step solution using the chosen heuristic.	10

	TWO + TWO FOUR	
Q 2 B	Solve any **One**	**10**
i)	Discuss alpha-beta pruning as improvement over min-max algorithm. Discuss how the values of alpha and beta are chosen for a two player game with a suitable example.	10
ii)	Consider an instance of graph coloring problem, wherein any two adjacent vertices cannot have the same color. Assuming the number of given colors =3, A. Solve the same using genetic algorithms. A sample chromosome could be: (1,2,1,2,1) wherein 1 and 2 are color numbers. You can use random numbers to assign the colors and use number of attacking pairs as fitness function. B. Show contents of all steps clearly. C. Compute answer till one generation.  Undirected Graph	10

Que. No.	Question	Max. Marks
Q3	Solve any **Two**	**20**
i)	What do you mean by Intelligent agents? Explain simple reflex agent as a solution for predictive text suggestion in mobile keyboard.	10
ii)	1. Gita likes all kinds of food. 2. Mango and chapati are food. 3. Gita eats almond and is still alive. 4. Anything anyone eats and isn't killed by it is food. • **Goal:** Gita likes almond. Represent in First order logic and use forward chaining to prove the goal. State all inference rules used clearly.	10
iii)	Explain typical steps for Natural Language Processing.	10

Que. No.	Question	Max. Marks
Q4	Solve any **Two**	**20**
i)	Describe Hill Climbing Search algorithm. What are the problems faced by Hill Climbing Search ? Explain the solutions too.	10
ii)	Describe steps in knowledge engineering process with respect to detection of Covid-19 infection when symptoms are given.	10

iii)	Design expert system for automated driving in mountains. Draw expert system component diagram and clearly state sample contents of them. State atleast 3 inference rules those might be part of the designed ES.	10

Que. No.	Question	Max. Marks
Q5	(Write notes / Short question type) on any **four**	**20**
i)	Explain the properties of task environment in Artificial Intelligence.	5
ii)	Consider a problem of arranging rainy season trip to Lonavla for a joint family of 10, ranging from ages 1 to 70. The trip would be planned for mid-June. A. Give atleast 2 plans of trip. B. What could be the uncertainties in the above plan.	5
iii)	Differentiate between planning and searching.	5
iv)	Differentiate between Uninformed search and Informed search strategy in AI.	5
v)	Explain the terms universal quantifier and existential quantifier.	5
vi)	State and discuss the things those AI cannot do in technical forum.	5