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DECEMBER 2023 (REEXAM)

TY INFORMATION TECHNOLOGY (SEMESTER – I)

COURSE NAME: ARTIFICIAL INTELLIGENCE

COURSE CODE: ITUA31201

(PATTERN 2020)

Time: [2 Hrs] **[Max. Marks: 60]**

Instructions to candidates:

1) **Figures to the right indicate full marks.**
2) **Use of scientific calculator is allowed**
3) **Use suitable data wherever required**
4) **All questions are compulsory. Solve any two sub questions each from each Question 1 ,2, 3,4,5,and 6 respectively**

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Illustrate with neat diagram and one example, the concept of Model-Based reflex agent.	[5]	1	2
	b) Elaborate the concept of Goal-Based reflex agent with neat diagram and example.	[5]	1	2
	c) Consider the scenario: Suppose we have a flashlight, and we teach a machine learning model that whenever someone says "dark" the flashlight should be ON, now the machine learning model will analyze different phrases said by people and it will search for the word "dark" and as the word comes the flashlight will be ON. Comment on failure cases of this model and suggest the solution.	[5]	1	3
Q2	a) How to make A* Admissible. Discuss both over-estimation and under-estimation scenario with suitable example.	[5]	2	4
	b) Formulate and solve the Graph Coloring constraint satisfaction problem. Given Un-directed Graph G(V, E), where V = {v1,v2,v3,v4} and E= {(v1,v2), (v2,v4), (v4,v3),(v3,v1), (v1,v4)}.	[5]	2	4
	c) Write a Pseudo algorithm for Generate and Test strategy used in Hill Climbing. Enlist the disadvantages of Hill Climbing.	[5]	2	3
Q3.	a) Enlist the steps involved in converting Logic statements into CNF form	[5]	3	2
	b) The other facts are given below: i) If it is sunny and warm day, you will enjoy. ii) If it is raining, you will get wet	[5]	3	3

	iii) It is a warm day iv) It is a raining v) It is sunny Draw resolution tree and prove that "You will Enjoy" using resolution concept. c)Solve to Unify this two expressions P1(x, f(y)) P2(a, f(g(z)) and show the substitution set	[5]	3	3
Q.4	a) Compare and contrast forward chaining and backward chaining. b) Compare and contrast different planning strategies such as goal-stack planning, non-linear planning, hierarchical planning c) "As per the law, it is a crime for an American to sell weapons to hostile nations. Country A, an enemy of America, has some missiles, and all the missiles were sold to it by Robert, who is an American citizen." Prove that "Robert is criminal." Apply the Forward chaining inference approach.	[5] [5] [5]	4 4 4	3 3 3
Q.5	a) Elaborate all the components of Expert System with its architecture diagram. b) Discuss the following two strategies used in Expert System with suitable example for each. i) a strategy of an expert system to answer the question, "What can happen next?" ii) an expert system finds out the answer to the question, "Why this happened?" c)Discuss the process of Building an Expert Systems. How expert system differs from conventional systems.	[5] [5] [5]	5 5 5	3 3 3
Q.6)	a) Provide in detail one real time AI-application scenario in the domain of Computer Vision. b) Discuss the challenges and approaches in machine translation. How do machine translation systems translate text from one language to another? c) Consider the ROBO ARM Application to identify and pick Square object to carry it from source ALL_Object basket to destination Square_Object basket. Specify locomotion and all components of a robot.	[5] [5] [5]	6 6 6	3 3 4

Note: [BT Level – 1. Remember 2. Understand 3. Apply 4. Analyze 5. Evaluate 6. Create]