KUMARAGURU
college of technology
character is life

B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Fifth Semester

COMPUTER SCIENCE AND ENGINEERING

U18CSE0003**:** Artificial Intelligence

COURSE OUTCOMES

CO1: Develop solutions for problems using various Artificial Intelligence concepts.

CO2: Design applications using PROLOG for making inferences.

CO3: Demonstrate usage of planning and decision making.

CO4: Apply the concepts of learning using Tensor Flow and any other programming language.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

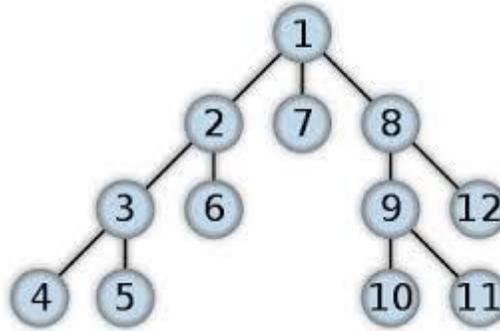|			
1.	Provide the PEAS description for a robotic arm.	CO1	[K2]
2.	Define an intelligent agent in the context of artificial intelligence and list its main components.	CO1	[K1]
3.	Outline the advantages of using first-order logic over propositional logic when modeling complex knowledge and reasoning tasks.	CO2	[K1]
4.	Find the MGU of $\{p(b, X, f(g(Z)))$ and $p(Z, f(Y), f(Y))\}$.	CO2	[K3]
5.	Differentiate between FSSP and BSSP.	CO3	[K1]
6.	List the constraints on rational preferences.	CO3	[K1]
7.	Define Uncertainty. List the sources of Uncertainty.	CO3	[K1]
8.	Differentiate between Active and Passive Learning.	CO4	[K1]
9.	What is a multilayer perceptron?	CO4	[K1]
10.	Explain the role of activation function in a neural network?	CO4	[K2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Formulate the vacuum world problem and illustrate the state space for the vacuum world.	8	CO1	[K2]
	b)	Explain the BFS and DFS algorithm perform the traversal for are given tree	8	CO1	[K2]

With Source node – 1 and Goal node – 9.

12.	a)	Show through logical deduction that the square P[1,2] in the Wumpus world is pit-free, using the rules and facts from your knowledge base.	8	CO2	[K$_3$]
	b)	Express the following sentences in FOL: (i)Anyone who kills an animal is loved by no one. (ii) Jack loves all animals. (iii)Tuna is a cat. (iv) Either Jack or Tom kills Tuna. (v) All parrots are cute.	8	CO2	[K$_3$]
13.	a)	Express the resolution steps to convert First order logic (FOL) statement to Conjunctive Normal Form (CNF)?	6	CO2	[K$_3$]
	b)	From the given facts, Prove that Traitor is a criminal using Forward chaining algorithm. The law says that it is a crime for a Gaul to sell potion formulas to hostile nations. The country Rome, an enemy of Gaul, has acquired some potion formulas, and these formulas were sold to it by Traitor. The traitor is a Gaul.	10	CO2	[K$_3$]
14.	a)	List the planning steps in spare tire problem and apply PDDL to describe the problem domain. Give a graph plan for the same with suitable justification for the edges.	10	CO3	[K$_3$]
	b)	Describe the partial order planning in Artificial Intelligence (AI) with suitable example.	6	CO3	[K$_1$]
15.	a)	Explain how Bayesian network useful to represent knowledge in uncertain domain using burglary alarm problem?	10	CO3	[K$_2$]
	b)	Explain Q Learning algorithm with suitable example.	6	CO4	[K$_1$]
16.	a)	Describe the various layers in Convolutional Neural Network with a neat sketch.	8	CO4	[K$_1$]
	b)	Illustrate the back propagation algorithm for neural nets and justify how it provides optimal solution.	8	CO4	[K$_2$]

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