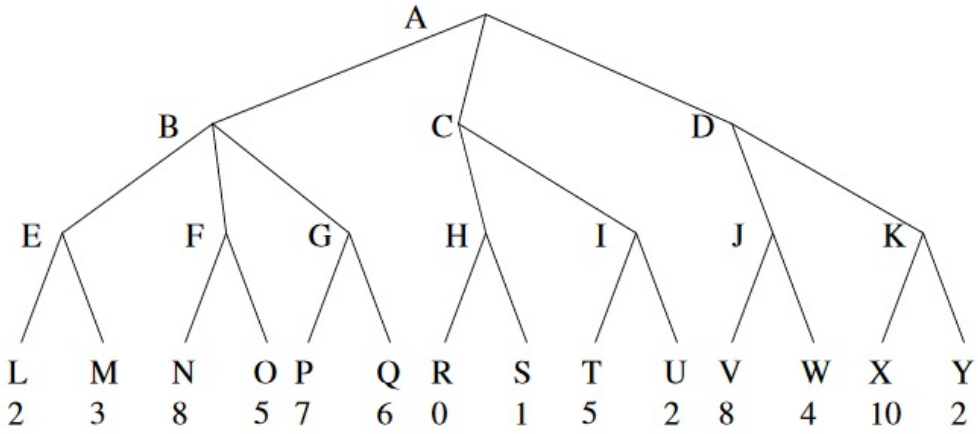
KONERU LAKSHMAIAH EDUCATION FOUNDATION
(Deemed to be University, Estd. u/s. 3 of UGC Act 1956)

B.Tech - Odd Sem : End Semester Exam
Academic Year:2020-2021

19CS2212A - Artificial Intelligence(Advanced)

Set No: 4

Time: **Max.Marks: 100**

S.NO	Answer All Questions	Choice	Options	Marks	CO
1.	Define Problem Formulation in solving problems by searching. Give a complete problem formulation for 4 queen's problem and also discuss how to measure problem solving performance.	choice Q-2		10Marks	CO1
2.	State and Discuss Iterative Deepening Depth First Search Algorithm with the help of an example highlighting advantages and disadvantages.			10Marks	CO1
3.	State and Discuss the logic of A*algorithm with the help of suitable example.	choice Q-4		15Marks	CO1
4.	Define PEAS description of a task environment. Also List and discuss different types of task environments with examples.			15Marks	CO1
5.	Outline the concept of Backtracking. Demonstrate "Backtracking" logic with the help of 4-queens problem.	choice Q-6		10Marks	CO2
6.	Outline Constraint Satisfaction Problem (CSP). Discuss CSP with the help of an example.			10Marks	CO2
7.	Consider the following game tree in which the static scores (at the tip nodes) are all from the first player's point of view. Assume that the first player is the maximizing player (i.e. MAX), and that high numbers represent better scores for MAX. 	choice Q-8		15Marks	CO2
7.A.	Outline the concept of game tree and Mini-Max algorithm. Use this algorithm to determine which move the first player should choose.			7Marks	CO2
7.B.	Examine the nodes which are to be pruned using the alpha-beta pruning algorithm assuming that nodes are examined in left-to-right order?			8Marks	CO2
8.	State and discuss simple Genetic algorithm mentioning the basic terminology used? Also discuss various operators used with the help of examples.			15Marks	CO2
9.	Discuss how forward and backward chaining procedures are used in drawing inferences with the help of an example.	choice Q-10		10Marks	CO3
10.	Consider the following knowledge base: The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American. Prove that 'Colonel West is a criminal' by applying Forward chaining method and backward chaining method. The facts given: i) $American(x) \wedge Weapon(y) \wedge Sells(x,y,z) \wedge Hostile(z) \rightarrow Criminal(x)$ ii) $\exists x\ Owns(Nono,x) \wedge Missile(x)$ iii) $Owns(Nono,M_1) \wedge Missile(M_1)$ iv) $Missile(x) \wedge Owns(Nono,x) \rightarrow Sells(West,x,Nono)$ v) $Missile(x) \rightarrow Weapon(x)$ vi) $Enemy(x,America) \rightarrow Hostile(x)$ vii) $American(West)$ viii) $Enemy(Nono, America)$			10Marks	CO3
11.	Convert following Well Formed Formulas into Conjugative Normal Form and use resolution in predicate logic to answer the question 'Loyalto(Marcus,Caesar)'.	choice Q-12		15Marks	CO3

	1. man(Marcus) 2. Pompeian(Marcus) 3. $\forall x$: Pompeian(x) $\rightarrow$ Roman(x) 4. ruler(Casear) 5. $\forall x$: roman(x) $\rightarrow$ loyalto(x,Caesar)$\vee$hate(x,Caesar) 6. $\forall x$: $\exists y$: loyalto(x,y) 7. $\forall x$: $\forall y$: person(x) ^ ruler(y) ^ tryassassinate(x,y) $\rightarrow\neg$loyalto(x,y) 8. tryassassinate(Marcus,Caesar)				
12.	Answer the following:			15Marks	CO3
12.A.	Discuss how forward chaining procedure is used in drawing inferences with the help of an example.			8Marks	CO3
12.B.	List out the differences between propositional logic and predicate logic.			7Marks	CO3
13.	List and Discuss with the help of examples the inference tasks of 'Filtering' and 'Most likely sequence' in Temporal models with reference to probabilistic reasoning over time.	choice Q-14		10Marks	CO4
14.	Narrate the purpose of Hidden Markov Models and also discuss the syntax and semantics of HMM highlighting the temporal tasks that can be answered using HMM			10Marks	CO4
15.	Answer the following:	choice Q-16		15Marks	CO4
15.A.	1% of the population has X disease. A screening test accurately detects the disease for 90% if people with it. The test also indicates the disease for 15% of the people without it (the false positives). Suppose a person screened for the disease tests positive. What is the probability that the person have the disease and what is the probability that the person does not have it?			8Marks	CO4
15.B.	Discuss the concept of Naive Bayes' Classifier with the help of an example.			7Marks	CO4
16.	Discuss in detail about the following temporal tasks with reference to probabilistic reasoning over time with help of examples. i) Filtering ii) Smoothing iii) Prediction iv) Most likely sequence			15Marks	CO4

[object HTMLDivElement]