Name:

VIT

Vellore Institute of Technology

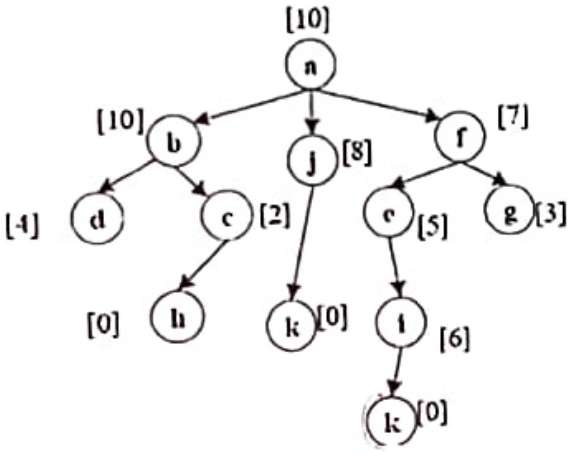
(Deemed to be University under section 3 of UGC Act 1956)

Continuous Assessment Test II

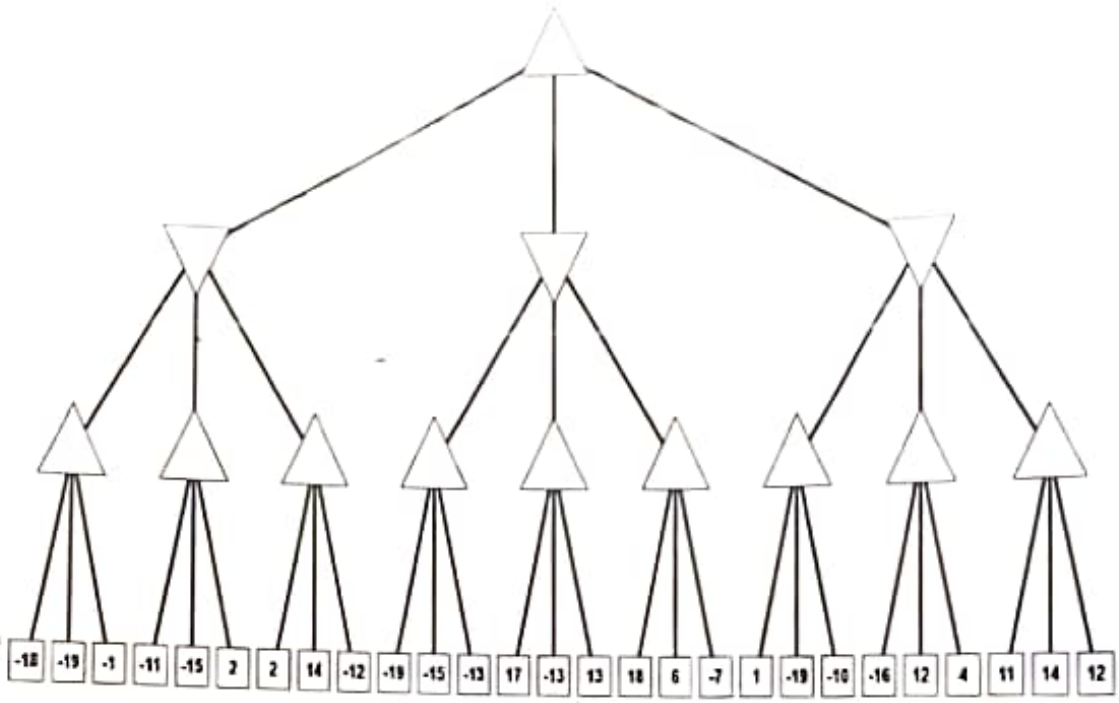
Programme	:	B.Tech(CSE) and its specializations	Semester	:	Winter22-23
Course	:	Artificial Intelligence	Code	:	BCSE306L
			Slot(s)	:	C2+TC2
Faculty	:	Dr. Abirami S Dr. Vijayalakshmi A Dr.Vedhapriyavadhana R Dr Hasmath Farhana A Dr. Krithiga R Dr.Rajarajeswari S Dr. Ganapathy S	Class Nbr	:	CH2022235001355 CH2022235001357 CH2022235001358 CH2022235001367 CH2022235001368 CH2022235001369 CH2022235001366
Time	:	1½ Hours	Max. Marks	:	50

Answer ALL the Questions

1. In the given graph 'a' is a starting node and 'k' is the goal state. The numbers nearest to the given node represent the heuristic value. Find the optimum solution using hill climbing search algorithm. Illustrate the different cases of algorithm struck and identify the ways to find the best solution. **10**



2. Use the Alpha-Beta pruning algorithm to prune the game tree given below assuming child nodes are visited from left to right. Show all final alpha and beta values computed at root, each internal node explored, and at the top of pruned branches. **10**
Note: show the pruned branches by applying the logical functions.



Consider the following sentence: **10**

[(Food ⇒ Party) ∨ (Drinks ⇒ Party)] ⇒ [(Food ∧ Drinks) ⇒ Party].

a. Using enumeration, determine whether the given sentence is valid, satisfiable (but not valid), or unsatisfiable. [3M]

b. Convert the left-hand and right-hand sides of the main implication into CNF, showing each step, and explain how the results confirm your answer to (a).[4M]

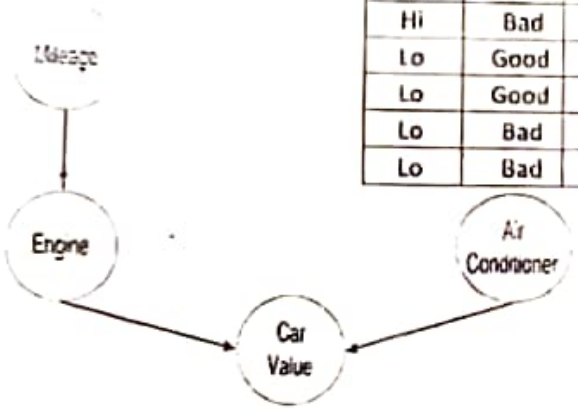
c. Prove your answer to (a) using resolution.[3M]

Consider the following statements and represent in First order logic and prove that the statement : "Scrooge is not a child" using the resolution procedure. **10**

1. Every child loves Santa.
2. Everyone who loves Santa loves any reindeer.
3. Rudolph is a reindeer, and Rudolph has a red nose.
4. Anything which has a red nose is weird or is a clown.
5. No reindeer is a clown.
6. Scrooge does not love anything which is weird.
7. (Conclusion) Scrooge is not a child.

Assume the following Bayesian belief network for car value. The number of records with the car values high (Hi) and low (Lo) are as given in the table. **10**

Mileage	Engine	Air Conditioner	Number of Records with Car Value=Hi	Number of Records with Car Value=Lo
Hi	Good	Working	3	4
Hi	Good	Broken	1	2
Hi	Bad	Working	1	5
Hi	Bad	Broken	0	4
Lo	Good	Working	9	0
Lo	Good	Broken	5	1
Lo	Bad	Working	1	2
Lo	Bad	Broken	0	2



(1) Draw the probability table for each node in the network. (4 marks)
(2) Use the Bayesian network and compute P(Engine=Bad, Air Conditioner=Broken) (3 marks)
(3) Use the Bayesian network and compute P(Mileage=Hi, Air Conditioner=Broken) (3 marks)

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