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VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (IT) IV Year I-Semester Supplementary Examinations, May-2019

Artificial Intelligence

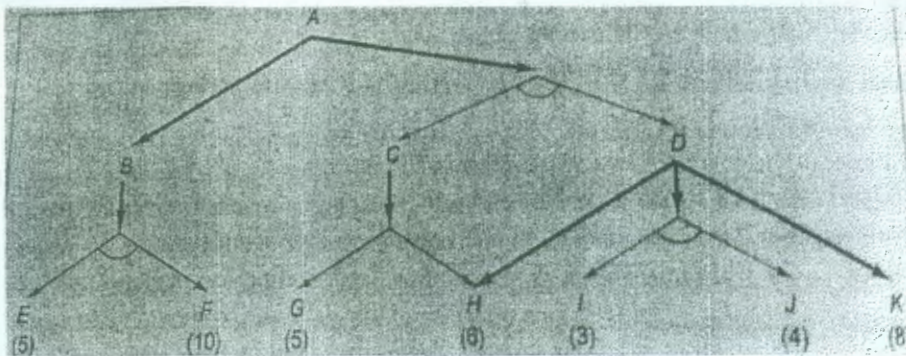
Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

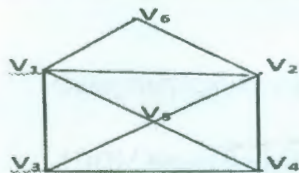
1. What is a Turing Test?
2. Find the Optimal Solution for Water Jug problem.
Water Jug problem: Mug A capacity is 5 Ltr. Mug B capacity is 3 Ltr.
Goal State : Get 4 Ltr of water in 5Ltr Mug
3. Compare & Contrast "State space problem and 'Game problem'".
4. Following figure shows a partial AND-OR graph with static evaluation values shown along with leaf nodes. Which is the **best path** from the root node A?



5. Draw an extended semantic network for "Rama gave the book to Sita".
6. Write a Prolog program to find the factorial of a number.
7. List the different phases in building an expert system.
8. Mention how Certainty Factor is calculated.
9. What is the drawback of a Single Layer Perceptron?
10. Define Gaussian function, clearly mentioning the terms that are involved in it.

Part-B (5 × 10 = 50 Marks)
(All sub-questions carry equal marks)

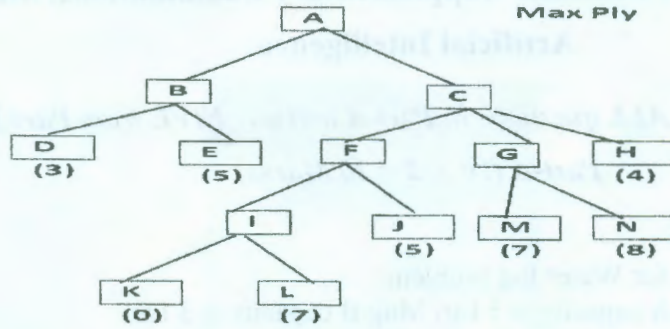
- 11.a) List the constraints of a Graph coloring problem.



Using these constraints to color the given Graph G.

- b) Draw the state space search for "Getting 90% marks in AI subject".

12.a) Apply α, β pruning on the following Game Tree where A is a Max Ply node:



b) Translate the following sentences to Clause form in Predicative Logic

- i) John likes all kinds of Food.
- ii) Apples are food
- iii) Chicken is food
- iv) Anything anytime eats and is not killed by is food
- v) Bill eats peanuts and is still alive
- vi) Srinu eats everything Bill eats

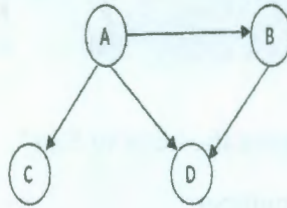
13.a) Construct a consistent frame representation for “Vasavi College of Engineering”.

b) Explain the general syntax of a Prolog Program.

14.a) Distinguish between Monotonic & Non-Monotonic TMS.

b) For the Bayesian Belief Network and the corresponding probabilities, generate the conditional probability table.

- P(A) = 0.4
- P(B|A) = 0.5
- P(B|~A) = 0.1
- P(C|A) = 0.6
- P(C|~A) = 0.3
- P(D|A, B) = 0.8
- P(D|A, ~B) = 0.3
- P(D|~A, B) = 0.3
- P(D|~A, ~B) = 0.05



Compute the following probabilities:

- i. Joint probability P(A,B,C,D)
- ii. P(A|B,C)

15.a) What are the limitations of Single-layer Perceptron? Explain how to overcome them.

b) How is error computed in a Feed Forward Network? Explain.

16.a) What are the characteristics of a Problem? Explain.

b) Differentiate between A* and AO* algorithms.

17. Answer any two of the following:

- a) Distinguish between Semantic Networks and Extended Semantic Networks, using appropriate examples.
- b) Suppose by observing E_1 and E_2 , we confirm our belief in H with MB $[H, E_1]=0.6$ and MD $[H, E_1]=0.2$, MB $[H, E_2]=0.3$ and MD $[H, E_2]=0.0$. Then, compute the following:
 - i) MB $[H, E_1 \text{ and } E_2]$ ii) MD $[H, E_1 \text{ and } E_2]$ iii) CF $[H, E_1 \text{ and } E_2]$
- c) Build a Radial Basis Function Neural Network for XOR. Clearly show the weights that are associated in the network.