

Serial No. 1971 A

[This question paper contains 2 printed pages]

Unique Paper Code: 2514000012

Name of the Course: B. Sc. (H) Electronics (GE)

Name of the Paper: Artificial Intelligence and Machine Learning

Semester: VI

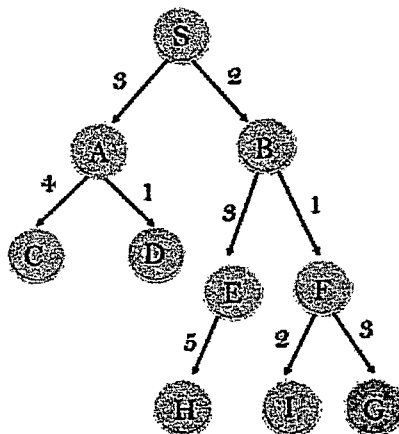
Duration: 3 hours.

Maximum Marks: 90

Instruction for Candidates

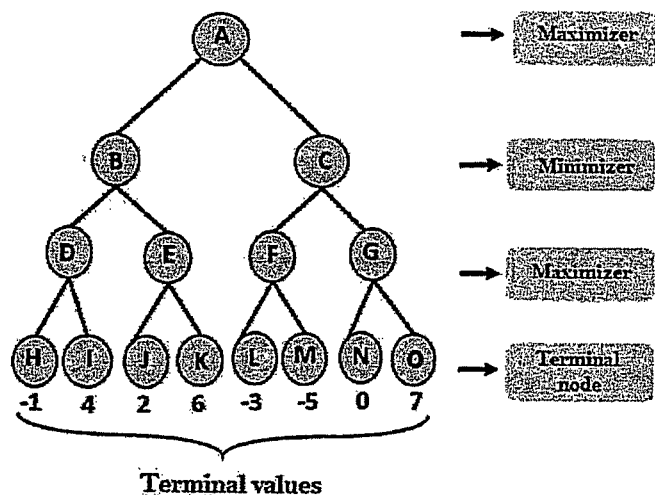
1. There are seven questions in all, out of which you have to attempt any **five** Questions.
2. All questions carry equal marks.
3. **First Question is Compulsory.**

1. (a) Draw a comparison between Random Forest and Decision Tree Algorithms? 3
(b) What is an environment? Differentiate between fully observable and partially observable environment. 3
(c) Define Outlier, Training Data and Test Data in Machine Learning. 3
(d) Write three differences between Clustering and Classification. 3
(e) Define the term Artificial Intelligence and give its two major applications. 3
(f) What do you understand by an Agent in AI systems? Describe the relationship between Agent, Agent Program and Task environment in AI system? 3
2. (a) Explain the complete working of a Goal Based and Utility Based Agents with the help of a block diagram. 9
(b) Compare and differentiate between Breadth-First Search (BFS) algorithm and Uniform Cost Search (UCS) algorithm in terms of (i) Time Complexity, (ii) Space Complexity (iii) Optimality and (iv) Completeness. 9
3. (a) What are the various steps involved in the formulation of an AI problem? Describe the steps involved in Formulation of the AI problem to reach the goal state in 8 queen's problem? 8
(b) For the given search graph determine the optimum path from A to Z using 10
 - (i) Greedy Best First Search
 - (ii) A* Search

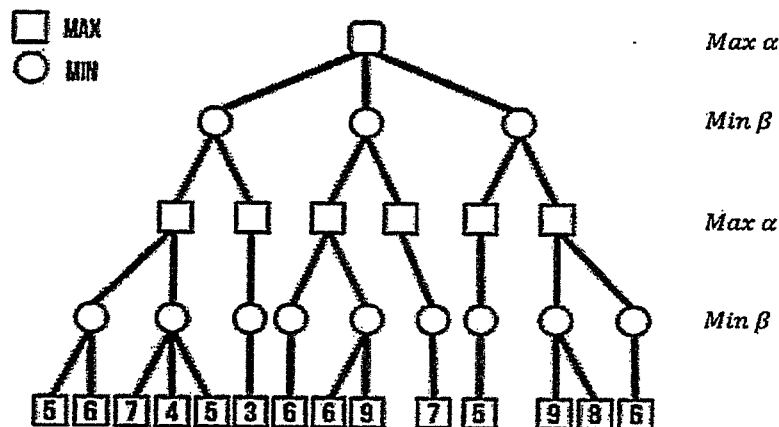


node	$H(n)$
A	12
B	4
C	7
D	3
E	8
F	2
H	4
I	9
S	13
G	0

4. (a) Give detailed description of Supervised, Unsupervised and reinforcement Learning. 9
 (b) What do you mean by Clustering? Describe K-means Clustering Algorithm? 9
- 5.(a) Explain why 'Minimax Game Search' algorithm is considered to be similar to depth first Search. For the given game search tree, apply Minimax Search to determine the complete game path and maximum score reached by MAX at the terminal Layer 9



- (b) In the given graph, Find the optimal path for having maximum chance of winning using Alpha-Beta pruning Algorithm. 9



- 6(a) Explain the Bayesian Belief Network used in AI systems? 9
 (b) A doctor is aware that disease meningitis causes a patient to have a stiff neck, and it occurs 70% of the time. He is also aware of some more facts, which are given as follows: 9
 (i) The Known probability that a patient has meningitis disease is 1/30,000.
 (ii) The Known probability that a patient has a stiff neck is 2%.
 What is the probability that a patient has diseases meningitis with a stiff neck?
7. (a) What are the different subsets of AI? Explain any one in detail? 9
 (b) What is Regression Analysis? Explain in detail the various types of regression techniques? 9