

6E7105

Total No. of Questions : 22

Total No. of Pages : 04

Roll No. :

6E7105

B.Tech. VI-Sem. (Main/Back) Exam. - 2024

COMPUTER SCIENCE AND ENGINEERING
ARTIFICIAL INTELLIGENCE

6CAI4-05 Principles of Artificial Intelligence

CS,IT,AID,CAI

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates :

Attempt all ten questions from Part-A, five questions out of seven questions from Part-B and three questions out of five questions from Part-C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in Form No. 205)

ersahilkagyan.com

1.

2.

PART-A

[10×2=20]

Answer should be given up to 25 words only

All questions are compulsory

Q. 1. Define atomic sentence and complex sentence.

- Q. 2. Define the terms 'syntax' and semantics'.
- Q. 3. What are the different types of machine learning?
- Q. 4. What is an expert system?
- Q. 5. What is the need for probability theory in uncertainty?
- Q. 6. Define Modus Ponens rule in propositional logic.
- Q. 7. What is heuristic function?
- Q. 8. Define supervised and unsupervised learning.
- Q. 9. What is the main condition required for alpha-beta pruning?
- Q. 10. Define Neural Networks.

PART-B

[5×4=20]

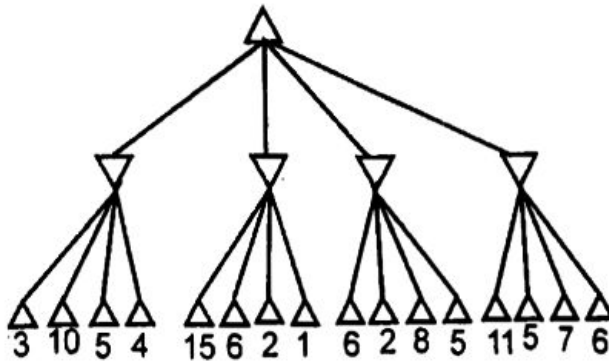
Analytical/Problem solving questions

Attempt any five questions

- Q. 1. What are Quantifiers? Discuss about different types of quantifiers.
- Q. 2. Differentiate propositional logic from first-order logic.
- Q. 3. What reasoning direction is a more suitable heuristic in the game of chess : forward or backward? Justify your answer by referring to the properties of the search space.
- Q. 4. Explain Bayesian networks with examples.
- Q. 5. Write short note on artificial neural networks.
- Q. 6. Explain Bayesian network and conditional independence with example.

Q. 7. Consider the following game tree :

- (a) Write down the minimax value of every non-terminal node next to that node :



- (b) Cross out the branches that do not need to be examined by alpha-beta search in order to find the minimax value of the top node.

PART-C

[3×10=30]

Descriptive/Analytical/Problem Solving/Design questions

Attempt any three questions

- Q. 1. Explain the A* search algorithm and give the proof of optimality of A*.
- Q. 2. Define the constraint satisfaction problem. Describe the elements in the definition of CSP. Use an example to define the map coloring problem as constraint satisfaction problem.
- Q. 3. Enumerate classical water Jug problem. Describe the state space for this problem. Solve this problem by giving its operation sequence.
- Q. 4. What is Natural Language Processing? Explain the various steps followed in NLP. Also discuss the different issues in NLP.
- Q. 5. Explain in detail the differences between supervised and unsupervised learning with the help of examples.