Writing anything except roll number on question paper will be deemed as an act of indulging in unfair means and action shall be taken as per rules.

4E060423

Roll No.: …… **Total No. of Pages: 3**

4E060423

B. Tech. IV Semester End-Term Examination (Main/ Back), April-2024

Branch: CSE (AI & ML)

4AIML4-04: Introduction to Artificial Intelligence

Time: 3 Hours **Maximum Marks: 100**

Instructions to Candidates:

The question paper is divided in three parts A, B & C.

(i) **Part-A:** 5 Basics/Fundamentals related questions (without choice).

(ii) **Part-B:** 5 Analytical/Numerical questions (with internal choice i.e. attempt one question either A or B from each question).

(iii) **Part-C:** 5 Descriptive/Analytical/Problem Solving/Design questions **(attempt any 3 out of 5)**.

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

Use of following supporting material is permitted during examination:

1. Nil 2. Nil

PART-A
(Basics/Fundamentals related questions)
All questions are compulsory

UNIT-I

Q.1 Define Artificial Intelligence. Write any three applications of artificial intelligence in real life. **[3]**

UNIT-II

Q.2 What do you understand by Heuristic Search Technique? **[3]**

UNIT-III

Q.3 What is knowledge Presentation? Give suitable example. **[3]**

UNIT-IV

Q.4 Discuss the elements of propositional logic? **[3]**

UNIT-V

Q.5 What do you understand by Game Playing Strategies in Artificial Intelligence? **[3]**

PART-B
(Analytical/Numerical questions)

UNIT-I

Q.6 (A) What do you mean by production systems? Explain the production characteristics. **[8]**

OR

Q.6 (B) Discuss various future challenges in Artificial Intelligence. **[8]**

UNIT-II

Q.7 (A) Explain the A* algorithm using a suitable example. **[8]**

OR

Q.7 (B) Differentiate between Breadth-First and Depth first search techniques **[8]**

UNIT-III

Q.8 (A) Consider the following sentences **[8]**

- John likes all kinds of food
- Apples are food
- Chicken is food
- Anything anyone eats and isn't killed by is food
- Bill eats peanuts and is still alive • Sue eats everything bill eats.

i) Translate these sentences into formulas in predicate logic
ii) Prove that john likes peanuts using backward chaining
iii) Convert the formulas of a part into clause form
iv) Prove that john likes peanuts using resolution

OR

Q.8 (B) Give the steps involved in converting wff predicates into clause form. Give an example in each step. **[8]**

UNIT-IV

Q.9 (A) How knowledge is represented using frames? Represent following knowledge using frames. **[8]**
Ram is name of an employee. His age is 27. He is male. He belongs to the department HR, where the number of employees is 110 and the average salary of the department is Rs. 45000. All departments are under JIET college. The organization type is Educational**.**

OR

Q.9 (B) Explain conceptual dependency with an example and build up the conceptual dependency structures for the following sentences: **[8]**

i) John pushed the cart.
ii) John took the book from Mary.
iii) While going home, I saw a frog.

UNIT-V

Q.10 (A) Why alpha beta pruning is necessary? How alpha beta pruning is done in game search, illustrate with an example**.** **[8]**

OR

Q.10 (B) Discuss the various types of Planning in Artificial Intelligence. **[8]**

PART-C
(Descriptive/Analytical/Problem Solving/Design questions)
(Attempt any 3 out of 5) (Q.11 to Q.15)

UNIT-I

Q.11 What is Hypothesis ? Briefly explain how AI Technique can be represented and list out some of the task domain of AI. **[15]**

UNIT-II

Q.12 Explain the Hill Climbing algorithm in detail. What are the problems associated with hill climbing techniques? How these problems can be solved. **[15]**

UNIT-III

Q.13 Explain the various rules for defining propositional and predicate logics? Write the unification algorithm and explain. **[15]**

UNIT-IV

Q.14 What are the problems in Representing Knowledge? Discuss Forward and Backward Reasoning in detail with example. **[15]**

UNIT-V

Q.15 Elaborate the step by step procedure for Min-Max Algorithm. Take example of your choice. Write down the properties and limitations of Min-Max Algorithm. **[15]**

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