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44 (SEM-6) HE6

2025

ARTIFICIAL INTELLIGENCE

Paper : BCA-HE-6066

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions : $1 \times 7 = 7$
 - (i) Which instruments are used for perceiving and acting upon the environment ?
 - (a) Sensors and Actuators
 - (b) Sensors
 - (c) Perceiver
 - (d) None of the above
 - (ii) Which search is implemented with an empty first-in-first-out queue ?
 - (a) Depth-first search
 - (b) Breadth-first search

- (c) Bidirectional search
- (d) None of the above

(iii) Depth First Search graph search algorithm uses data structure for its implementation.

- (a) Stack
- (b) Queue
- (c) tree
- (d) Both (a) and (b)

(iv) Which search is equal to Min Max search but eliminates the branches that can't influence the final decision ?

- (a) Depth-first search
- (b) Breadth-first search
- (c) Alpha-beta pruning
- (d) None of the above

(v) In AI, why is unification important ?

- (a) It simplifies calculations
- (b) It helps in resolving conflicts
- (c) It enables reasoning with knowledge bases
- (d) It reduces memory usage

(vi) The Bottom-up parsing method is also called

- (a) Predictive parsing
- (b) Shift reduce parsing
- (c) Recursive descent parsing
- (d) None of the above

(vii) Bayesian probabilistic inference in AI uses Bayes' theorem to update prior beliefs with new evidence. (*True/False*)

2. Define the following terms : $2 \times 4 = 8$

- (i) Rational Agent
- (ii) Discrete *vs.* Continuous Environment
- (iii) Heuristics Search Techniques
- (iv) Context free Grammar

3. Answer **any three** from the following :

$5 \times 3 = 15$

- (a) Explain Min Max Algorithm.
- (b) Describe the advantages and disadvantages of Depth First Search.
- (c) Describe Resolution Principle.

(d) Explain the Apha-Beta pruning.
(e) Describe Bottom up Parsing with an example.

4. Represent the following fact in Predicate logic : 10

(a) Every human respects his parent
(b) Mango and vegetable are food
(c) Some girls play tennis
(d) Not all students like both Mathematics and Science
(e) John likes all kind of food

5. Write a prolog program to implement Palindrome. 10

OR

Write a prolog program to find the maximum of two numbers.

6. Discuss about Artificial Intelligence and its overall impact on productivity. 10