

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B.Tech. Summer 2021-22 Examination**

**Semester: 7**  
**Subject Code: 03105431**  
**Subject Name: Artificial Intelligence**

**Date: 12-04-2022**  
**Time: 10:30am to 1:00pm**  
**Total Marks: 60**

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**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1** Fill in the blanks, one word answer, Select Appropriate answer as asked below (All are compulsory) (Each of one mark) **(15)**

1. A game can be formally defined as a kind of search problem with the following components:
  - a) Initial State
  - b) Successor Function
  - c) Terminal Test
  - d) All of the mentioned
2. Where does the value of alpha-beta search get updated?
  - a) Initial state itself
  - b) Along the path of search
  - c) At the end
  - d) None of the mentioned
3. The field that investigates the mechanics of human intelligence is:
  - a) history
  - b) cognitive science
  - c) psychology
  - d) sociology
4. Which form is called as conjunction of disjunction of literals?
  - a) Context normal form
  - b) Disjunctive normal form
  - c) Conjunctive normal form
  - d) All of the mentioned
5. Translate the following statement into FOL. "For every a, if a is a philosopher, then a is a scholar"
  - a)  $\forall a \text{ philosopher}(a) \text{ scholar}(a)$
  - b)  $\exists a \text{ philosopher}(a) \text{ scholar}(a)$
  - c) All of the mentioned
  - d) None of the mentioned
6. \_\_\_\_\_ search uses the problem specific knowledge beyond the definition of the problem
7. What is a heuristic function?
8. A\* is optimal if h(n) is an admissible heuristic-that is, provided that h(n) never underestimates the cost to reach the goal.
  - a) False
  - b) True
9. Difference between forward and backward reasoning
10. Initial value of Beta= \_\_\_\_\_ & Alpha= \_\_\_\_\_ in the alpha-beta pruning
11. \_\_\_\_\_ approach is the best way to go for Game playing problem
12. Write advantages of artificial intelligence.
13. What is fuzzification?
14. What are rules of inference?
15. What is Bayes Nets.

**Q.2** Answer the following questions. (Attempt any three) **(15)**

- A) What is artificial Intelligence? What are major areas of Artificial Intelligence? Explain briefly.

- B) Consider the game tree given in Fig. 1, in which the evaluation function values are shown below each leaf node for the max player. Assume that the root node corresponds to the minimizing player. Assume that the search always visits children left-to-right which nodes will not be examined by the alpha-beta pruning algorithm? Show the process of alpha-beta pruning to justify your answer.

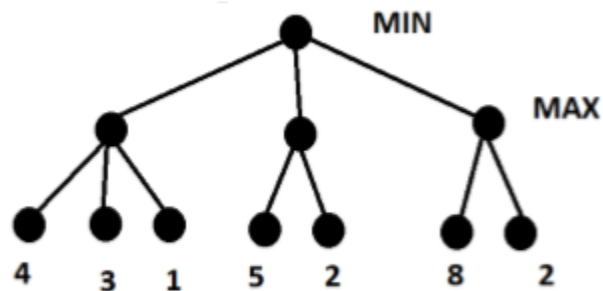


Fig : 1

- C) Give Advantages and characteristics of Expert System.  
 D) Explain Hill climbing with example
- Q.3** A) Explain A\* algorithm in detail. (07)  
 B) Explain issues in knowledge representation (08)
- OR**
- B) Why Simulated Annealing search method has been introduced? Justify your answer (08)
- Q.4** A) Describe Depth First Search. Comment on the optimality of this method. Also explain difference between DFS & BFS (07)
- OR**
- A) Explain semantic net with example. (07)  
 C) Solve the following Crypt arithmetic problem (08)
- D O N A L D**  
**+ G E R A L D**  
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**R O B E R T**