

(b) What a note on how artificial neuron models from the biological neuron? Also explain different type of learning in ANN. (10)

7. What is an Expert System? Can Expert System do mistakes? Give architecture and working of Non-Rule Base Expert System. (15)

Roll No. ....

Total Pages : 4

**311603**

**May 2022**

**BCA VI SEMESTER**

**Artificial Intelligence (BCA-17-308)**

Time : 3 Hours]

[Max. Marks : 75

*Instructions :*

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

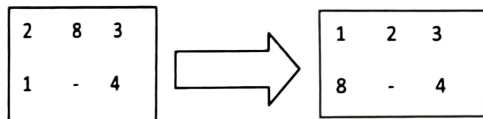
**PART-A**

1. (a) Define the terms: knowledge and Intelligence. (1.5)  
(b) Represent the knowledge about "Student of JC BOSE UST using semantic net". (1.5)  
(c) What are advantages of FOPL over PL? (1.5)  
(d) What is the criterion to check success of a machine. (1.5)  
(e) Represent the following statements using Thematic Role Frame?  
(a) Geeta will read the book at 10.00 A.M  
(b) The bell was taken out of town by Rahul by car for a day for Simran. (1.5)

- (f) Prove that A\* search algorithm is complete and optimal among all search algorithms. (1.5)
- (g) What do you mean by production system? Can every problem be formalize using it? (1.5)
- (h) Why heuristics search is preferred over brute force search techniques? (1.5)
- (i) State Dempster Shafer Theory of Evidence. (1.5)
- (j) Differentiate b/w Best First Search Vs Depth First search. (1.5)

### PART-B

2. (a) What is AI? Explain its origin and its various applications. (10)
- (b) What is problem state space? Explain water jug problem to explain this. (5)
3. (a) What are different problems with Hill Climbing and how are they resolved? Solve the following problem using Hill Climbing. (10)



- (b) What is difference between Alpha vs Beta pruning? (5)

4. (a) Give an algorithm for conversion of predicates into clauses. (5)
- (b) What is Planning? Why it is necessary? Explain partial order planning Algorithm. (10)
5. (a) Write a note on Expert System Shells. (5)
- (b) Consider the following piece of knowledge
- Ram, Sham and Hari are members of ECO club.
  - Every ECO club member who is not a swimmer is a mountain climber.
  - Mountain climbers do not like rains.
  - Anyone who does not like water is not a swimmer.
  - Sham dislikes whatever Ram dislikes and likes what Ram likes?
  - Ram likes rain and water.
- Represent the knowledge as predicate statements. Process the query "Is there a member of ECO club is not a mountain climber but a swimmer." Using resolution by refutation method. (10)

6. (a) What are the characteristics of AI problems? Apply constraint satisfaction to solve following cryptarithmic problem.

$$\begin{array}{r}
 \text{CROSS} \\
 +\text{ROAD} \\
 \hline
 \text{DANGER}
 \end{array}$$

(5)