B.E. (Computer Science Engineering) Sixth Semester (C.B.S.)

Artificial Intelligence

P. Pages : 2 **NIR/KW/18/3490**

Time : Three Hours * 1 2 6 0 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.

1. a) What is Artificial Intelligence? Explain various applications of AI. **5**

b) You are given 20 gallon, 13 gallon and 7 gallon water jugs. The 20 gallon jug is full of water. Neither of them has measuring mark on it. How can you get exactly 10 gallon of water in 20 gallon and 13 gallon jug? Write down production rules and steps followed. **9**

OR

2. a) For each of the following AI problems, analyze 7 problem characteristics **any three.** **9**
i) Travelling salesman problem ii) Tower of Hanoi
iii) Chess iv) Missionaries and cannibals

b) What is knowledge? Explain different types of knowledge. **5**

3. a) Write and explain Hill Climbing algorithm explain the terms: **7**
i) Ridge ii) Platue iii) Local Maximum

b) Write the difference between BFS and DFS. At what circumstances BFS is better than DFS? Also discuss its advantages and disadvantages. **6**

OR

4. a) Write AO* algorithm explain it with example. **7**

b) Explain Informed and un-informed search techniques in detail. **6**

5. a) Write and explain different approaches to knowledge representation. Also explain its properties. **5**

b) Consider the following statements: **8**
i) Mona likes all kinds of food.
ii) Apples are food.
iii) Chicken is food
iv) Anything anyone eats and is it killed are food
v) Satyam eats peanuts and is still alive.
vi) Ashu eats everything Satyam eats

* Translate the above statements in predicate logic.
* Prove that Mona likes peanuts using backward chaining.

OR

6. a) Write down a script on "College Picnic" **6**

b) What is semantic network? Represent the following statements using semantic network. **7**
   i) The dog bit the mail carrier.
   ii) Every dog has bitten a mail carrier.

7. a) Explain Bayesian Networks with example. **7**

b) Write short notes on: **6**
   1) Axioms of probability
   2) Fuzzy logic
   3) Un-certain knowledge

OR

8. a) What is TMS? (Truth Maintenance System) Draw its diagram and explain. **6**

b) What is reasoning? What are its types? What is the difference between Monotonous and Non-Monotonous reasoning? **7**

9. a) What is Learning? Draw a general block diagram of learning system and explain it in detail. **7**

b) Write short notes on:
   1) Learning by induction. **2**
   2) Learning by taking advice. **2**
   3) Explanation based learning. **3**

OR

10. a) What is Natural language understanding? What are levels of knowledge used in NLU? Explain phases of NLU. **7**

b) What are transition networks? Explain Augmented Transition Networks (ATNs) & RTN's (Recursive Transition Networks) in brief. **7**

11. a) What is expert systems? Explain different components of expert system. **7**

b) Explain various steps to develop an expert systems. **6**

OR

12. a) What is Meta-knowledge? Explain how it is used in expert system with example. **6**

b) Explain expert system shell with example. **7**

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