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Code No.: 9135 M

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
M.Tech. (CBCS : CSE) I-Semester Make up Examinations, March-2017

Artificial Intelligence

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. Define the Heuristic function that can be used in solving 8-puzzle problem.
2. State Turing test.
3. What is the purpose of Semantic Network?
4. Consider a set $S = \{\sim (A \vee B), (C \rightarrow B), (A \vee C)\}$ of formulae. Show that S is unsatisfiable.
5. Write the role of a Shell of an Expert System.
6. If the probability of John has a cold is 0.30, the probability of John was observed sneezing when had cold in the past is 0.8 and the probability of John observed sneezing when he did not cold is 0.20. Find the probability of John have a cold when he sneezes.
7. Draw the block diagram of Learning System.
8. Define a perceptron.
9. Define Fuzzy Set.
10. What are different types of Fuzzy membership functions?

Part-B (5 × 10 = 50 Marks)

11. a) Explain eight types of problem characteristics. [5]
b) Solve the crypt arithmetic puzzle [5]
$$\begin{array}{r} \text{B A S E} \\ + \text{B A L L} \\ \hline \text{G A M E S} \end{array}$$
12. a) Convert the formula $(\sim A \rightarrow B) \wedge (C \wedge \sim A)$ into its equivalent CNF representation. [5]
b) Describe the knowledge representation structure of Frames with examples. [5]
13. a) Describe the phases in Building Expert Systems. [5]
b) State and prove the Baye's theorem. [5]
14. a) Write the Decision tree learning algorithm. [5]
b) Write the Backpropagation learning algorithm for feed forward multilayer network. [5]
15. a) Given $U = \{5, 10, 20, 30, 40, 50, 60, 70\}$ [5]
 $A = \{(20, 0.1) (30, 0.3) (40, 0.5) (50, 0.3) (60, 0.5) (80, 1)\}$
 $B = \{(20, 0.8) (30, 0.6) (40, 0.5) (50, 1) (60, 0.5) (70, 0.5)\}$
Find $A \cdot B, A (+) B, A \circ B, \text{Height } (A) \text{ Cardinality } (A)$.
b) Explain parsing a sentence using RTN. [5]

- 16. a) Write the A* algorithm. [6]
- b) Compare forward versus backward reasoning. [4]
- 17. Write short notes on any *two* of the following:
 - a) Knowledge acquisition features of an Expert System. [5]
 - b) K-means clustering Algorithm [5]
 - c) Fuzzy set operations. [5]

