

(Time:  $2\frac{1}{2}$  hours)

[Total Marks: 60]

N. B.: (1) All questions are compulsory.

- (2) Make suitable assumptions wherever necessary and state the assumptions made.
- (3) Answers to the same question must be written together.
- (4) Numbers to the right indicate marks.
- (5) Draw neat labeled diagrams wherever necessary.
- (6) Use of Non-programmable calculator is allowed.

1. Attempt any two of the following:

- a. Describe AI along with its applications.
- b. Explain Expert System. Brief the phases in building Expert System.
- c. With a neat diagram explain the working of an Expert system.
- d. What is a Blackboard system? Explain its components.

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2. Attempt any two of the following:

- a. Explain Bayes theorem.
- b. Write notes on conditional probability.
- c. Given  $U=\{1,2,3,4,5,6,7,8,9,10\}$ ,  $A=\{(1,.5),(3,.9),(5,.2),(7,.5)\}$ ,  
 $B=\{(1,.3),(2,.8),(5,.6),(7,.7),(9,.7)\}$   
Find 1. Complement of A, A intersection B, A Union B, A Bold Union B, A Bold Intersection B.
- d. What are the various types of member functions in fuzzy sets? Brief about any 4 member functions with diagram.

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3. Attempt any two of the following:

- a. What are the components of a learning system? Brief on some basic learning methods?
- b. Explain support vector machines.
- c. Brief on multi-layer feed forward network.
- d. Write notes on Hopfield network.

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4. Attempt any two of the following:

- a. Write notes on genetic algorithm.
- b. What is swarm intelligence? Name any two swarm intelligence systems.
- c. Brief on the architecture of the intelligent agents.
- d. Explain Agent Communication Language.

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5. Attempt any two of the following:

- a. What are the 11 conceptual primitive actions?
- b. What are the CD representations of the following sentences?
  - i. Killing is caused because of taking drugs.
  - ii. John purchased house from Mike.
  - iii. Jenny cried.
- c. Explain top-down and bottom-up parsing.
- d. Brief on universal words.

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