

(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: 12

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

2. Attempt any two of the following: 12

- Explain Bayes theorem.
- Write notes on conditional probability.
- 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
- What are the various types of member functions in fuzzy sets? Brief about any 4 member functions with diagram.

3. Attempt any two of the following: 12

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

4. Attempt any two of the following: 12

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

5. Attempt any two of the following: 12

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