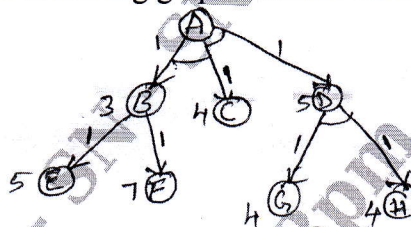


Max. Marks: 100

## Module-1

- OR**

- Fig. Q2(c)



## Module-2

- | Example | Sky   | Air Temp | Humidity | Wind   | Water | Forecast | Enjoy Sport |
|---------|-------|----------|----------|--------|-------|----------|-------------|
| 1       | Sunny | Warm     | Normal   | Strong | Warm  | Same     | Yes         |
| 2       | Sunny | Warm     | High     | Strong | Warm  | Same     | Yes         |
| 3       | Rainy | Cold     | High     | Strong | Warm  | Change   | No          |
| 4       | Sunny | Warm     | High     | Strong | Cool  | Change   | Yes         |

OR

- | Instance | Sky   | Air Temp | Humidity | Wind   | Water | Forecast | Enjoy Sport |
|----------|-------|----------|----------|--------|-------|----------|-------------|
| A        | Sunny | Warm     | Normal   | Strong | Cool  | Change   | ?           |
| B        | Rainy | Cold     | Normal   | High   | Warm  | Same     | ?           |

**Important Note :**

1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg,  $42 \times 8 = 50$ , will be treated as malpractice.

- b. What are Horn Clauses? Write a declarative and a procedural representation. List syntactic difference between Logic and PROLOG. (08 Marks)

### Module-3

- 5 a. Construct decision tree using ID3 algorithm for the following data : (12 Marks)

Day	Outlook	Temp	Humidity	Wind	Decision
1	Sunny	Hot	High	Weak	Yes
2	Sunny	Hot	High	Strong	No
3	Overcast	Hot	High	Weak	Yes
4	Rain	Mild	High	Weak	No
5	Rain	Cool	Normal	Weak	Yes

- b. Derive Gradient descent rule. (08 Marks)

### OR

- 6 a. Give decision tree to represent the following Boolean functions :  
 i)  $A \wedge \neg B$     ii)  $A \vee [B \wedge C]$     iii)  $A \text{ XOR } B$     iv)  $[A \wedge B] \vee [C \wedge D]$ . (08 Marks)
- b. Explain Perceptron with appropriate diagram Represent AND Boolean function using Perceptron. (04 Marks)
- c. Write Back propagation algorithm. (08 Marks)

### Module-4

- 7 a. A patient takes a lab test and the result comes back positive. The test returns a correct positive result in only 98% of the cases in which the disease is actually present and a correct negative result in only 97% of the cases in which the disease is not present. Further, 0.008 of the entire population have the Cancer. Does a patient have Cancer or not? (10 Marks)
- b. Derive Brute force MAP learning and also mention assumption made in this process. (10 Marks)

### OR

- 8 a. Explain Minimum Description Length Principle (MDL). (06 Marks)
- b. Explain Naïve Bayes classifier and Bayesian belief Networks. (08 Marks)
- c. Write EM algorithm. (06 Marks)

### Module-5

- 9 a. Explain K – NN algorithm. (06 Marks)
- b. Explain steps of Locally Weighted Linear regression. (07 Marks)
- c. Describe Radial basis function with appropriate diagram. (07 Marks)

### OR

- 10 a. Illustrate the basic concept of Q – learning using Simple Deterministic World. (10 Marks)
- b. Explain Q – Learning algorithm. (10 Marks)

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