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Question Paper Code	12702
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B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Sixth Semester

Electronics and Communication Engineering
20ECEL609 - MACHINE LEARNING TECHNIQUES

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

	Marks	K- Level	CO
1. Define Version Space.	2	K1	CO1
2. List applications of machine learning.	2	K1	CO1
3. Define Inductive Learning Hypothesis.	2	K1	CO2
4. Outline the effect of reduced Error pruning in decision tree algorithm.	2	K2	CO2
5. State the concept of Artificial neural network.	2	K1	CO3
6. Sketch the basic neural network architecture.	2	K2	CO3
7. Define Bayes Theorem.	2	K1	CO4
8. List the advantages of studying Bayesian learning methods.	2	K1	CO4
9. What is Sequential Covering Algorithm?	2	K2	CO6
10. What is explanation based learning?	2	K2	CO6

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a)	Discuss the learning system in detail and discuss the perspectives and issues in the Machine learning system.	13	K2	CO1
OR				
b)	Explain in detail Supervised, Unsupervised and Reinforcement machine learning algorithm.	13	K2	CO1
12. a)	Explain the candidate elimination algorithm obtain the final version space for the training example.	13	K3	CO2

	Sky	Humid	Temp	wind	Water	Forecast	Label
1	Sunny	Warm	Normal	Strong	Warm	Same	Y
2	Sunny	Warm	High	Strong	Warm	Same	Y
3	Rainy	Cold	High	Strong	Warm	Change	N
4	Sunny	Warm	High	Strong	Cold	Change	Y

OR

- b) With the given example construct the hypothesis set using Find-S algorithm 13 K3 CO2

Day	Outlook	Temperature	Humidity	Wind	Play Tennis
1	Sunny	Hot	High	Weak	No
2	Sunny	Hot	High	Strong	No
3	Overcast	Hot	High	Weak	Yes
4	Rain	Mild	High	Weak	Yes
5	Rain	Cool	Normal	Weak	Yes
6	Rain	Cool	Normal	Strong	No
7	Overcast	Cool	Normal	Strong	Yes
8	Sunny	Mild	High	Weak	No
9	Sunny	Cool	Normal	Weak	Yes
10	Rain	Mild	Normal	Weak	Yes
11	Sunny	Mild	Normal	Strong	Yes
12	Overcast	Mild	High	Strong	Yes
13	Overcast	Hot	Normal	Weak	Yes
14	Rain	Mild	High	Strong	No

13. a) Describe about perceptron neural network model, delta learning rule and draw the decision surface represented by a two input perceptron. 13 K2 CO3

OR

- b) i) Sketch the Genetic algorithm cycle. Explain each block in detail 6 K2 CO3
ii) Explain in detail the Baldwin and Lamarckian theory of Evolution. 7 K2 CO3

14. a) i) 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. Furthermore, 0.008 of the entire population have this cancer. Does the patient have cancer, or does he not? 5 K3 CO4

- ii) Write down the Brute force Bayes Concept Learning. 8 K2 CO4

OR

- b) i) Explain the Bayesian belief network in detail. Describe the conditional Independence. 7 K2 CO4

- ii) Define Bayes theorem and Explain in detail. 6 K2 CO4

15. a) i) Explaining first order learning sets with an example Ancestor(x,y) 6 K2 CO6

- ii) Discuss in detail Sequential Covering Algorithm for the following example 7 K2 CO6

	Sky	Humid	Temp	wind	Water	Forecast	Label
1	Sunny	Warm	Normal	Strong	Warm	Same	Y
2	Sunny	Warm	High	Strong	Warm	Same	Y
3	Rainy	Cold	High	Strong	Warm	Change	N
4	Sunny	Warm	High	Strong	Cold	Change	Y

OR

- b) Explain in detail the *13 K2 CO6*
(i) First-Order Horn Clauses
(ii) Basic terminology in horn clauses.

PART - C (1 × 15 = 15 Marks)

16. a) Discuss in detail lazy learning of K-NN instance based learning *15 K2 CO5*
algorithm.

OR

- b) Discuss in detail the Case based Reasoning with example. *15 K2 CO5*