Roll No. 2020503550

B.E (FT) END SEMESTER EXAMINATIONS – MAY / JUNE 2023

Computer Science and Engineering
Sixth Semester
CS6301 & Machine Learning
(Regulation 2018 - RUSA)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Differentiate classification and regression problems.
2. Find the number of distinct instances, syntactically distinct and semantically distinct hypotheses possible for the training samples given for the problem number 11.
3. What are the significant of bias node and learning rate in ANN model?
4. What is independent component analysis?
5. Define – Markov decision process.
6. Differentiate- bagging with boosting.
7. What is the need of gain ratio computation compared to information gain?
8. Differentiate SARSA with Q-Learning.
9. Compare and contrast – LSTM with GRU.
10. Define the need of ReLU and softmax activation functions.

PART – B (8 x 8 = 64 marks)
(Answer any 8 questions)

11. Write the candidate elimination algorithm and apply the same for the training samples given below.

Sl. No.	Education Qualification	Presentation skill	Technical	Answering the questions	Gender	Marital status	Recommended
1	pg	good	good	yes	Male	Married	yes
2	pg	average	good	yes	Female	Single	yes
3	ug	poor	poor	no	Male	Single	No
4	pg	good	good	yes	Female	Window	yes

12. Find whether the candidate x has pg qualification, presentation skill is average, technically Good, answer for all the questions, male and married, is recommended or not based on the

Samples given in the problem no. 11, using Naïve Bayes model.

13. Derive the slope and intercept of regression line. Apply linear regression to find the temperature of 6th and 8th days based on the following samples.

Days	Temperature (in F)
1	98
2	98
3	99
4	99
5	100

14. Derive the back propagation.

15. Construct RBF network for solving XOR problem with 2 inputs using Gaussian functions (for (0,0), (0,1), (1,0), (1,1) as centers respectively) with the weights 1, -1,-1 & 1 with 2 neibours and all variances are assumed to be equal to 1.

16. Apply LDA to the following set of points (1,1), (2,1), (1,2), and (2,2) belongs to class 1 and (4,4), (4,5), (5,4), and (5,5) belongs to class 2.

17. Explain - Gaussian Mixture model.

18. Discuss SVM model and various kernels used in SVM.

19. Explain –genetic algorithm and its operators.

20. Construct – decision tree (CART model) for the problem number 11.

21. Write down K-means clustering algorithm. Apply the same for the set of samples (1,1,1), (1,2,1)),(2,1,1), (5,5,5),(5,6,5),(5,5,6) and (9,9,10), (10,10,9) with K=3

22. Discuss – construction of CNN model.

PART – C (2 x 8 = 16marks)

23. Write down MLP algorithm.

24. Construct MLP model with 2 inputs, 1 and 0 as outputs, one hidden layer with 3 hidden nodes with following given initial random weight and bias values. Find the error and weight updates for single iteration with learning rate =0.1.

x_1	x_2	w_{13}	w_{23}	w_{14}	w_{24}	w_{15}	w_{25}	w_{36}	w_{46}	w_{56}
1	0	0.2	0.3	-0.4	0.2	0.3	-0.1	0.2	-0.3	0.4
		Θ_3	Θ_4	Θ_5	Θ_6	Θ_7		w_{37}	w_{47}	w_{57}
		-0.1	0.2	0.1	0.2	-0.1		0.1	0.2	0.2