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**Question Paper Code:**

M.E/Ph.D. DEGREE EXAMINATION, APRIL 2024

Elective

Communication Systems

21PCM527- MACHINE LEARNING

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1. (a) Discuss in detail about the two types involved in predicting data in patterns using supervised learning. CO1- U (20)  
Or  
(b) Discuss in detail about reinforcement learning and analyze the calculation of state-action values using Bellman equation. CO1- U (20)
2. (a) Analyze the performance of Multivariate Regression algorithm in a condition that property dealer wants to set housing prices which are based various factors like Size of house, No of bedrooms with the help of matrix operation. CO4- Ana (20)  
Or  
(b) Analyze the performance metrics of regression and classification linear models by comparing them in terms of predicting the data and justify which performs better. CO4- Ana (20)
3. (a) Assume the data in a lower-dimensional space and implement the mathematical intuition of LDA to separate the different classes of data. CO2- App (20)  
Or  
(b) Design and implement linear discriminant analysis reduction technique using Python Code with the help Scikit-learn library on the Iris dataset. CO2- App (20)

4. (a) Analyze the back propagation algorithm by assuming two input and hidden units and how do you fine tune the weights of the neural network in terms of its error rate. CO4- Ana (20)
- Or
- (b) Analyze the linear activation functions of back propagation in neural network and justify its performance in terms of error functions and network topology. CO4- Ana (20)
5. (a) Discuss in detail about Supervised clustering for image segmentation and compression. CO1- U (20)
- Or
- (b) Explain in detail about the Challenges in medical image segmentation using Supervised clustering. CO1- U (20)