Exam. Code: 0925
Sub. Code: 6547

2122

B.E. (Information Technology)
Seventh Semester
IT-702: Machine Learning

Time allowed: 3 Hours

Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Part.*

x-x-x

1.	(a) What will be the score for classification, if feature X0 = 1, X1= 3 and X2 = 2 theta0=1, theta1=1, theta2=-1.5. (b) Which algorithm is used in neural network to update weights and how? (c) What is the role of learning rate parameter in theta/weight updation? Explain using a numerical example. (d) How dimensionality reduction is achieved in supervised and unsupervised learning methods? (e) What is the Markov Chain?	(10)
	Part A	
2.	Calculate errors for following cases. (a) $\theta_0 = 0, \theta_1 = 1$, (b) $\theta_0 = 1, \theta_1 = 0$, (c) $\theta_0 = 0.5, \theta_1 = 1$ (d) $\theta_0 = 0.2, \theta_1 = 0.3$ If X= 300 and Y =350	(10)
3.	(a) Derive the equation for n theta values for multiple linear regression. Also give final equation for model in matrix form. (b) Derive equation for maximum likelihood estimation and log likelihood.	(5) (5)
4.	Design neural network for XNOR gate. (using numerical example)	(10)
	Part B	
5.	Find Principal components for C = $\begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$	(10)
6.	(a) Compare PCA, LDA and ICA (b) Calculate variance and covariance for the following data. Let mean = (0,0). X1 = {(-2,1), (0,0), (2,-1)}, X2 = {(2,1), (0,0),{-2,-1)}	(5) (5)
7.	(a) Let, Initial mean = 30 and variance =1. Find best variance using maximum likelihood method. Assume dummy data accordingly (b) Explain Hidden Markov model with the help of an example.	(5) (5)

x-x-x