



**SIDDHARTH GROUP OF INSTITUTIONS:: PUTTUR
(AUTONOMOUS)**

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QUESTION BANK (DESCRIPTIVE)

Subject with Code: Statistical Machine Learning (16IT610) Course & Branch: B.Tech - CSIT

Year & Sem: IV-B.Tech& I-Sem

Regulation: R16

UNIT –I

INTRODUCTION TO MACHINE LEARNING AND SUPERVISED LEARNING

1	(a) Explain in detail about applications of machine learning.	[L2][CO1]	[6M]
	(b) What is Supervised Learning?	[L1][CO1]	[6M]
2	Write about learning a class from examples in supervised learning.	[L2][CO1]	[12M]
3	(a) Elaborate about Noise in Supervised learning.	[L2][CO1]	[6M]
	(b) Describe about learning multiple classes Supervised learning	[L2][CO1]	[6M]
4	Discuss about PAC Learning	[L6][CO1]	[12M]
5	Explain in detail about Dimensions of a Supervised machine learning algorithm	[L2][CO1]	[12M]
6	What is Machine Learning? Explain with an example.	[L1,L2][CO1]	[12M]
7	Describe with examples some useful applications of machine learning.	[L2][CO1]	[12M]
8	Define Machine Learning. Discuss with examples why machine learning is important.	[L1,L6][CO1]	[12M]
9	Write in detail about examples of Machine learning applications.	[L1][CO1]	[12M]
10	(a) What are the issues in Machine Learning?	[L1][CO1]	[6M]
	(b) Differentiate between Supervised and Reinforcement Learning	[L1][CO1]	[6M]

UNIT –II**BAYESIAN DECISION THEORY AND PARAMETRIC METHODS**

1	(a) Define Bayes theorem. Explain with an example	[L1][CO2]	[6M]
	(b) What are the features of Bayesian theorem?	[L1][CO2]	[6M]
2	Explain about Discriminant functions in Bayesian Decision Theory.	[L2][CO2]	[12M]
3	Write about Association Rules in Bayesian Decision Theory	[L1][CO2]	[12M]
4	(a) What are the steps involved in Apriori algorithm	[L1][CO2]	[6M]
	(b) Write an example of Decision regions and Decision boundaries	[L1][CO2]	[6M]
5	Elaborate about the difficulties of Bayesian Theorem.	[L2][CO2]	[12M]
6	Discuss about Classification in Bayesian Decision theory.	[L6][CO2]	[12M]
7	(a) What is Parametric method? Explain.	[L1,L2][CO2]	[6M]
	(b) Explain about Bernouli and Gaussian Density	[L2][CO2]	[6M]
8	Discuss in brief about the Bayesian Estimator.	[L2][CO2]	[12M]
9	Explain about regression in parametric methods.	[L2][CO2]	[12M]
10	What is Maximum Likelihood Estimation? Explain with examples.	[L1,L2][CO2]	[12M]

NON PARAMETRIC METHODS AND SUPPORT VECTOR MACHINES

1	(a) What is Histogram Estimator? Explain	[L1][CO3]	[6M]
	(b) Describe about K-Nearest Neighbor Estimator	[L2][CO3]	[6M]
2	(a) Write about Kernel Estimator.	[L1][CO3]	[6M]
	(b) Explain briefly about Non Parametric Methods.	[L2][CO3]	[6M]
3	Discuss in brief about Nonparametric Density Estimation	[L1,L2][CO3]	[12M]
4	Write short notes on the following: (a) Parametric methods	[L1][CO3]	[6M]
	(b) Nonparametric methods	[L1][CO3]	[6M]
5	Write about the Support Vector Machines.	[L1][CO3]	[12M]
6	Elaborate about the Maximal Margin Classifier.	[L2][CO3]	[12M]
7	Discuss about Support Vector Classifiers	[L1,L2][CO3]	[12M]
8	(a) What is a Hyperplane? Explain	[L1,L2][CO3]	[6M]
	(b) Explain the Construction of Maximal Margin Classifier	[L2,CO3]	[6M]
9	What is Supervised Learning? Discuss SVM.	[L1,L6][CO3]	[12M]
10	Write short notes on the following: (a) Classification with Non-Linear Decision Boundaries	[L1][CO3]	[6M]
	(b) How SVM works? Explain.	[L1][CO3]	[6M]

UNIT –IV
UNSUPERVISED LEARNING AND CLUSTERING METHODS

1	What is the Challenge of Unsupervised Learning? Explain.	[L1,L2][CO4]	[12M]
2	Differentiate between Supervised and Unsupervised Learning.	[L2][CO4]	[12M]
3	(a) What are the Principal Components? Discuss	[L1,L6][CO4]	[6M]
	(b) Discuss the uses of Principal Components.	[L6][CO4]	[6M]
4	Explain in detail about Principal Component Analysis	[L2][CO4]	[12M]
5	Discuss the applications of Unsupervised Learning	[L6][CO4]	[12M]
6	What is Clustering? Explain with an example	[L1,L2][CO4]	[12M]
7	Discuss about Clustering methods.	[L6][CO4]	[12M]
8	(a) Write about K-Means Clustering	[L1][CO4]	[6M]
	(b) Compare Clustering and Classification	[L1][CO4]	[6M]
9	Elaborate about the Hierarchical Clustering with an example	[L2][CO4]	[12M]
10	What are the Practical issues in Clustering? Discuss.	[L1,L6][CO4]	[12M]

UNIT –V**REINFORCEMENT LEARNING AND TEMPORAL DIFFIERENCE LEARNING**

1	What is Reinforcement Learning? Explain.	[L1,L2][CO5]	[12M]
2	Differentiate Reinforcement Learning and Supervised Learning	[L2][CO5]	[12M]
3	Discuss various real time applications of Reinforcement Learning	[L6][CO5]	[12M]
4	Write in detail about Elements of Reinforcement Learning.	[L2][CO5]	[12M]
5	Illustrate in detail about Model Based Learning.	[L2][CO5]	[12M]
6	a) How do you write a Reinforcement learning algorithm	[L1][CO5]	[6M]
	b) What are the applications of Reinforcement learning in Real world?	[L1][CO5]	[6M]
7	Explain in detail about Temporal Difference Learning	[L2][CO5]	[12M]
8	(a) What are the Exploration strategies? Discuss	[L1,L6][CO5]	[6M]
	(b) Discuss about Deterministic Rewards and Actions	[L6][CO5]	[6M]
9	Write Short notes on the following: (a) Non-Deterministic Rewards and Actions	[L1][CO5]	[6M]
	(b) Eligibility Traces	[L1][CO5]	[6M]
10	Write short notes on the following: (a) Generalization	[L1][CO5]	[6M]
	(b) Real time applications of Temporal Difference Learning	[L1][CO5]	[4M]

Preparedby:**Professor/CSIT**