Course Code: 20CS0904 **R20**

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
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QUESTION BANK (DESSCRIPTIVE)

Subject with Code:

INTRODUCTION TO MACHINE LEARNING (20CS0904) **Course & Branch:** B. Tech – CSM

Year & Sem: III B.Tech & I-Sem **Regulation:** R20

UNIT –I
INTRODUCTION MACHINE LEARNING

1		Describe about Machine Learning algorithms with their predictions.	**[L2][CO1]**	**[12M]**
2		Define basic concepts in Machine Learning.	**[L1][CO1]**	**[12M]**
3		Discuss the Machine Learning techniques with neat diagrams	**[L2][CO2]**	**[12M]**
4		Explain about Supervised Learning techniques.	**[L2][CO3]**	**[12M]**
5		Explain the Un-Supervised Learning techniques.	**[L2][CO2]**	**[12M]**
6	a)	What is the role of pre-processing of data in machine learning? Why it is needed?	**[L3][CO1]**	**[6M]**
	b)	Analyze Reinforcement Learning with neat diagram.	**[L4][CO1]**	**[6M]**
7	a)	Explain data processing and techniques used for data preprocessing.	**[L2][CO1]**	**[6M]**
	b)	Analyze the real world applications of ML.	**[L4][CO1]**	**[6M]**
8		Write about brief explanation for Probability theory	**[L3][CO1]**	**[12M]**
9	a)	Differentiate the Bias and Variance tradeoff in Machine Learning.	**[L4][CO1]**	**[6M]**
	b)	Compare Machine Learning and Artificial Intelligence.	**[L4][CO1]**	**[6M]**
10	a)	What is Machine learning? Explain the need of it.	**[L2][CO1]**	**[6M]**
	b)	List out applications and some popular algorithms used in Machine Learning. Explain it.	**[L1][CO1]**	**[6M]**

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UNIT –II
CLASSIFICATION AND REGRESSION

1	Explain about machine learning classification and its usage.		**[L2] [CO1]**	**[12M]**
2	Explain Decision Tree Classification technique with an example.		**[L2] [CO1]**	**[12M]**
3	a)	Describe about Multivariate Tree prediction.	**[L1] [CO1]**	**[6M]**
	b)	Describe about Univariate Tree prediction.	**[L1] [CO1]**	**[6M]**
4	Explain the role of Pruning in machine learning.		**[L1][CO1]**	**[12M]**
5	Explain in detail about a) Lasso Regression b) Ridge Regression		**[L2][CO1]**	**[12M]**
6	Explain about Linear Regression and its types.		**[L2][CO3]**	**[12M]**
7	a)	Explain in detail about polynomial regression technique	**[L2] [CO2]**	**[6M]**
	b)	Differentiate between classification and regression.	**[L4] [CO2]**	**[6M]**
8	Describe about Multiple linear regression and MLR equations		**[L1][CO2]**	**[12M]**
9	Explain in details of types of Regression model in ML.		**[L2] [CO2]**	**[12M]**
10	Explain about real world Applications of regression in machine learning.		**[L2] [CO1]**	**[12M]**

Course Code: 20CS0904 **R20**

UNIT –III
Learning Models and Decision Theory

1	A	Describe Artificial Neural Networks	[L1][CO3]	**[4M]**
	B	Sketch the types of architectures of neural networks	[L2][CO3]	**[8M]**
2	What is multilayer perceptron? Explain in detail.		[L2][CO4]	**[12M]**
3	A	Explain single layer perceptron in detail	[L2][CO3]	**[6M]**
	B	Explain multi-layer perceptron in detail	[L2][CO3]	**[6M]**
4	Describe a) Feed Forward Neural Networks b) Recurrent Neural Networks c) Convolutional Neural Networks		[L1][CO3]	**[12M]**
5	A	State and explain implementation of multilayer perceptron.	[L1][CO4]	**[6M]**
	B	What are the advantages of multilayer perceptron?	[L1][CO4]	**[6M]**
6	Explain back propagation algorithm with example?		[L2][CO4]	**[6M]**
7	A	Describe Bayesian decision classifier.	[L2][CO4]	**[6M]**
	B	Explain linear discriminant analysis	[L1][CO4]	**[6M]**
8	Explain linear discriminant analysis with an example?		[L2][CO4]	**[12M]**
9	Distinguish logistic regression and Bayesian logistic regression.		[L4][CO3]	**[12M]**
10	A	State and explain discriminant functions	[L2][CO4]	**[6M]**
	B	Differentiate between linear and nonlinear discriminant functions	[L1][CO4]	**[6M]**

Course Code: 20CS0904 **R20**

UNIT –IV
BAYESIAN DECISION THEORY AND PARAMETRIC METHODS

1		Explain Bayesian decision theory in detail.	[L2][CO4]	**[12M]**
2		Write are the classifications in Bayesian decision theory? State with example?	[L3][CO4]	**[12M]**
3		Explain in detail about Expectation- Maximization algorithm with an example?	[L2][CO4]	**[12M]**
4		Explain discriminant functions?	[L2][CO4]	**[12M]**
5		Define parametric methods? Explain Maximum Likelihood Estimation.	[L1][CO4]	**[12M]**
6		State and explain the following a. Bernoulli density b. Multinomial density c. Gaussian density	[L1][CO4]	**[12M]**
7	a	Write about bias and variance?	[L3][CO4]	**[6M]**
	b	Describe the Bernoulli density? Give an example?	[L1][CO3]	**[6M]**
8		Explain the concept of bias and variance trade off?	[L3][CO5]	**[12M]**
9	a	What is bias/variance dilemma? Explain in detail?	[L1][CO3]	**[6M]**
	b	What is estimator? explain briefly	[L1][CO4]	**[6M]**
10		Explain various model selection procedures?	[L2][CO4]	**[12M]**

Course Code: 20CS0904 **R20**

UNIT –V
MULTIVARIATE METHODS

1		Write about multivariate methods?	[L3][CO5]	**[12M]**
2		What is parameter estimation method? Explain in detail?	[L1][CO5]	**[12M]**
3		Explain multivariate normal distribution in detail?	[L2][CO4]	**[12M]**
4	a	List the features of multivariate normal distribution?	[L1][CO6]	**[6M]**
	b	Write the applications of multivariate normal distribution?	[L3][CO4]	**[6M]**
5		State and explain tuning complexity?	[L1][CO5]	**[12M]**
6	a	Write some features of multivariate normal distribution?	[L3][CO5]	**[6M]**
	b	List few parameter estimation techniques?	[L1][CO3]	**[6M]**
7		Explain in detail about clustering and types of clustering?	[L2][CO5]	**[12M]**
8	a	Explain how multivariate regression is implemented?	[L3][CO5]	**[6M]**
	b	Describe the uses of multivariate regression?	[L1][CO4]	**[6M]**
9		Explain in detail about a) Agglomerative Clustering b) Hierarchical Clustering	[L2][CO5]	**[12M]**
10	a	Define Parameter with example? Describe parameter estimation method in detail?	[L1][CO4]	**[6M]**
	b	What is minimum mean square error estimation?	[L1][CO4]	**[6M]**

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