Course Code: 20CS0906 **R20**

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

Subject with Code: **Advanced Machine Learning(20CS0906)** Course & Branch: **B.Tech – CSM**

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

UNIT –I
INTRODUCTION

1	a	What is Machine learning? Explain the need of it.	**[L2][CO1]**	**[4M]**
	b	List out applications and algorithms used in Machine Learning. Explain it?	**[L2][CO1]**	**[8M]**
2		List the Machine Learning Algorithm in testing near to excepted.	**[L1][CO1]**	**[12M]**
3	a	Differentiate Machine Learning and Artificial Intelligence.	**[L6][CO5]**	**[6M]**
	b	Describe classification techniques in supervised learning with an examples.	**[L2][CO1]**	**[6M]**
4	a	List out various Unsupervised learning techniques used in Machine Learning.	**[L1][CO5]**	**[4M]**
	b	Analyze the clustering techniques with examples.	**[L3][CO2]**	**[8M]**
5	Explain about Supervised Learning techniques.		**[L2][CO3]**	**[12M]**
6	a	Explain Model Selection in Machine learning.	**[L2][CO1]**	**[6M]**
	b	Describe Generalization process in machine learning.	**[L2][CO1]**	**[6M]**
7	a	Compare Supervised learning and Unsupervised learning	**[L6][CO1]**	**[6M]**
	b	Analyze Reinforcement Learning with neat diagram..	**[L4][CO1]**	**[6M]**
8	Discuss clustering and association rules in unsupervised learning.		**[L2][CO2]**	**[12M]**
9	Analyze the classification and regression techniques in supervised learning.		**[L4][CO1]**	**[12M]**
10	a	Establish the Association rules in unsupervised learning.	**[L3][CO2]**	**[6M]**
	b	Analyze the real world applications of ML.	**[L4][CO6]**	**[6M]**

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UNIT-II

SUPERVISED LEARNING

1	a	Differentiate Supervised Learning and Unsupervised Learning	**[L4][CO5]**	**[5M]**
	b	Explain Decision Tree Classification technique with an example.	**[L2][CO6]**	**[7M]**
2	a	Describe classification techniques in supervised learning.	**[L2][CO1]**	**[8M]**
	b	List out various Regression techniques in Machine Learning.	**[L1][CO1]**	**[4M]**
3	a	Compare Univariate and Multivariate Decision Trees.	**[L5][CO1]**	**[6M]**
	b	Explain about Pruning in supervised learning.	**[L2][CO1]**	**[6M]**
4	a	Differentiate various Parametric and Non-Parametric Methods.	**[L4][CO1]**	**[6M]**
	b	Analyze Bayesian Decision theory in supervised learning.	**[L4][CO1]**	**[6M]**
5	Summarize the following models. (i) Linear regression (ii) Logistic regression		**[L2][CO1]**	**[12M]**
6	a	Organize how to Tackle Over fitting and Under fitting.	**[L4][CO3]**	**[6M]**
	b	Explain logistic regression in machine learning.	**[L2][CO1]**	**[6M]**
7	a	Illustrate Multi-Layer Perceptron with neat architecture.	**[L3][CO3]**	**[6M]**
	b	Analyze Regression discrimination in machine learning.	**[L4][CO1]**	**[6M]**
8	Discuss Back Propagation Algorithm with an example.		**[L2][CO3]**	**[12M]**
9	Analyze Maximum Likelihood Estimation in supervised learning.		**[L4][CO3]**	**[12M]**
10	a	Express the Evaluation of Estimator bias and variance.	**[L6][CO3]**	**[6M]**
	b	Illustrate Gradient Descent algorithm and its variants.	**[L3][CO3]**	**[6M]**

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UNIT –III

UNSUPERVISED LEARNING

1		Discuss the following terms in unsupervised learning i. Association rules ii . Clustering	**[L2][CO5]**	**[12M]**
2	a	Explain the various Clustering algorithms.	**[L2][CO2]**	**[8M]**
	b	List out the various applications of clustering.	**[L1][CO6]**	**[4M]**
3	a	Illustrate the mixtures of latent variable models with suitable example.	**[L3][CO3]**	**[6M]**
	b	How mixture density is calculated in unsupervised learning?	**[L1][CO2]**	**[6M]**
4	a	Analyze the working principle of K-means Clustering.	**[L4][CO2]**	**[7M]**
	b	Give the different types of Partitioned algorithms used in clustering.	**[L2][CO2]**	**[5M]**
5	a	List out the various types of Cluster methods in unsupervised learning.	**[L1][CO6]**	**[8M]**
	b	Infer the similarities and differences between average-link clustering and k-means?	**[L4][CO5]**	**[4M]**
6	a	Generalize K-Means Clustering algorithm in Unsupervised Learning.	**[L6][CO2]**	**[6M]**
	b	Estimate the problems associated with clustering large data.	**[L5][CO6]**	**[6M]**
7		Describe the various types of Hierarchal Clustering techniques.	**[L2][CO3]**	**[12M]**
8	a	Analyze the Expectation-Maximization algorithm with simple Example.	**[L4][CO3]**	**[6M]**
	b	Explain about Gaussian Mixture Models.	**[L2][CO3]**	**[6M]**
9	a	Demonstrate linkage methods in Hierarchical Clustering.	**[L2][CO3]**	**[6M]**
	b	How can we measure the distance between two clusters?	**[L1][CO3]**	**[6M]**
10	Summarize the following terms briefly i.K-means Clustering ii. Hierarchal Clustering		**[L2][CO5]**	**[12M]**

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UNIT-IV
DIMENTIONALITY REDUCTION
&
NONPARAMETRIC METHODS

1	a	Define and Explain about Non parametric Methods.	**[L2][CO3]**	**[6M]**
	b	List out Advantages and limitations of Non parametric methods in ML.	**[L1][CO3]**	**[6M]**
2		State and explain various Non-Parametric Density Estimation techniques	**[L1][CO3]**	**[12M]**
3	a	Analyze the K-Nearest Neighbor Algorithm with simple example.	**[L4][CO6]**	**[6M]**
	b	Express the Non Parametric classification Techniques.	**[L6][CO3]**	**[6M]**
4	a	Illustrate Condensed Nearest Neighbor (CNN).	**[L3][CO4]**	**[6M]**
	b	Differentiate Exploratory and Confirmatory factor analysis.	**[L5][CO4]**	**[6M]**
5	a	List out the Applications of PCA in machine learning.	**[L1][CO6]**	**[6M]**
	b	Distinguish between parametric and non-parametric classifications.	**[L4][CO5]**	**[6M]**
6	a	Discuss the Principle Component Analysis.	**[L2][CO5]**	**[6M]**
	b	Describe the Factor Analysis Technique.	**[L2][CO5]**	**[6M]**
7		List out and explain the various dimensionality reduction techniques.	**[L2][CO3]**	**[12M]**
8	a	Explain Linear Discriminant Analysis.	**[L2][CO4]**	**[8M]**
	b	Outline the various applications of Linear Discriminant Analysis.	**[L1][CO6]**	**[4M]**
9	a	Compare Multidimensionality scaling and Metric dimensionality scaling.	**[L5][CO5]**	**[6M]**
	b	List out the applications of MDS.	**[L1][CO6]**	**[6M]**
10	a	Differentiate Feature selection and Feature Extraction.	**[L2][CO3]**	**[6M]**
	b	Explain about Subset Selection Techniques.	**[L4][CO4]**	**[6M]**

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UNIT –V

REINFORCEMENT LEARNING

1	a	Define and explain about the Reinforcement learning.	**[L2][CO4]**	**[6M]**
	b	Compare unsupervised learning and Reinforcement learning.	**[L4][CO5]**	**[6M]**
2	a	Explain various types of reinforcement learning techniques.	**[L2][CO4]**	**[6M]**
	b	List out the advantages and disadvantages of Reinforcement Learning.	**[L1][CO1]**	**[6M]**
3	a	List the applications of Reinforcement Learning and explain it.	**[L2][CO6]**	**[6M]**
	b	Differentiate the Reinforcement learning and Supervised learning.	**[L4][CO5]**	**[6M]**
4		Analyze the working process of Reinforcement learning.	**[L4][CO3]**	**[12M]**
5	a	Explain in detail about Single State Case: K-Armed Bandit problem	**[L2][CO4]**	**[6M]**
	b	What are the Elements involved in Reinforcement Learning using Markov Decision Process (MDP)?	**[L1][CO4]**	**[6M]**
6	a	Explain Model-Based Learning with an example.	**[L2][CO4]**	**[6M]**
	b	Distinguish between model based learning and temporal difference learning.	**[L5][CO5]**	**[6M]**
7	a	Illustrate in detail about K-Armed Bandit in reinforcement learning.	**[L3][CO4]**	**[6M]**
	b	Describe Exploration and Exploitation strategies in temporal difference learning.	**[L1][CO4]**	**[6M]**
8	a	Describe various parameters used inTemporal Difference Learning.	**[L2][CO4]**	**[6M]**
	b	List out the advantages, disadvantages of Temporal difference learning.	**[L2][CO5]**	**[6M]**
9	a	Explain the Nonparametric rewards and actions in temporal difference learning.	**[L2][CO5]**	**[6M]**
	b	Assess in detail about partially observables states in Reinforcement learning.	**[L5][CO5]**	**[6M]**
10	a	Explain Generalization process in Model Based Learning.	**[L2][CO5]**	**[6M]**
	b	Difference between Model based learning and Model free learning	**[L1][CO4]**	**[6M]**

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