Hall Ticket No | | | | | | | | | | |

Code No: ACS014

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER - I

B.Tech VIII Semester End Examinations (Regular), May-2020

Regulations: IARE-R16

MACHINE LEARNING

COMPUTER SCIENCE AND ENGINEERING

Time: 3 hours **Max. Marks: 70**

Answer ONE Question from each Unit All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

1.	a)	Discuss the Concept learning. Explain in detail about need of learning with a diagram.	**[7M]**
	b)	Differentiate between Training and Testing. Discuss in detail about Learning System model with a neat diagram.	**[7M]**
2.	a)	Elaborate the supervised and unsupervised learning. Discuss the semi supervised and reinforcement learning.	**[7M]**
	b)	Explain the machine learning structure with an example. Discuss in detail about under-fitting and over-fitting.	**[7M]**

UNIT – II

3.	a)	Elaborate multi-layer perception with the help of a neat diagram. Explain the importance of machine learning.	**[7M]**
	b)	Explain in detail about multilayer networks and the back propagation algorithm with an example.	**[7M]**
4.	a)	Explain the importance of gradient descent weight-update rule and explain the adding momentum.	**[7M]**
	b)	Discuss in detail about the Propagation support vector Machines. Explain the Optimal separation, kernels with an example.	**[7M]**

UNIT – III

5.	a)	Discuss Bayes theorem with an example. Explain in detail about concept learning.	**[7M]**
	b)	Explain about brute-force MAP learning algorithm. Discuss in detail about brute-force Bayes concept learning.	**[7M]**
6.	a)	Discuss in detail about Naive Bayes classifier. Explain about m-estimate of probability.	**[7M]**
	b)	Explain the importance of Bayes optimal classifier and discuss the Bayes optimal classification with a suitable example.	**[7M]**

UNIT – IV

7.	a)	Explain the importance of genetic programming, and discuss the remarks on genetic programming.	**[7M]**
	b)	Elaborate the Ensemble learning with a suitable example. Discuss in detail about Boosting.	**[7M]**
8.	a)	Differentiate between Boosting and bagging. Discuss in detail about Dimensionality reduction with a suitable example.	**[7M]**
	b)	Elaborate the Linear discriminate analysis with the help of example Discuss in detail about Principal component analysis (PCA).	**[7M]**

UNIT – V

9.	a)	Define outlier. Discuss about Similarity and distance measures with a suitable example.	**[7M]**
	b)	Elaborate the hierarchical methods. Discuss in detail about partitional algorithms with a suitable example.	**[7M]**
10.	a)	Explain the importance of clustering large databases. Discuss the advantages and disadvantages of clustering.	**[7M]**
	b)	Define cluster. Discuss the clustering with categorical attributes, comparison with a suitable example.	**[7M]**

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COURSE OBJECTIVES:

The course should enable the students to:

I.	Apply knowledge of computing and mathematics appropriate to the discipline.
II.	Illustrate the concepts of machine learning and related algorithms.
III.	Understand the dimensionality problems using linear discriminates.
IV.	Study various statistical models for analyzing the data.
V.	Learn clustering algorithms for unlabeled data.

COURSE OUTCOMES:

CO 1	Understand the concept of learning and candidate elimination algorithms.
CO 2	Understand the concept of perception and explore on forward and backward practices.
CO 3	Explore on basic statistics like variance, covariance and averages.
CO 4	Explore on Evolutionary learning techniques used in genetic algorithms.
CO 5	Explore on similarity concept and different distance measures.

COURSE LEARNING OUTCOMES:

Students, who complete the course, will have demonstrated the asking to do the following:

SI. No.	Description
ACS014.01	Understand the concept of learning and candidate elimination algorithms.
ACS014.02	Explore on different types of learning and explore On tree based learning.
ACS014.03	Understand the construction process of decision trees used for classification problem.
ACS014.04	Understand the concept of perception and explore on forward and backward practices.
ACS014.05	Illustrate on kernel concept and optimal separation used in support vector machines.
ACS014.06	Explore on basic statistics like variance, covariance and averages.
ACS014.07	Understand the concepts of Gaussian and bias-variance tradeoff.
ACS014.08	Understand the concepts of Bayes theorem and Bayes optimal classifiers.
ACS014.09	Explore on Bayesian networks and approximate inference on markov models.
ACS014.10	Explore on Evolutionary learning techniques used in genetic algorithms.
ACS014.11	Illustrate the ensemble learning approaches used in bagging and boosting.
ACS014.12	Explain the importance of principal component analysis and its applications.
ACS014.13	Explore on similarity concept and different distance measures.
ACS014.14	Understand the outlier concept and explain about data objects
ACS014.15	Understand the hierarchical algorithms and explain CART
ACS014.16	Understand the partitioned algorithms and explain segmentation
ACS014.17	Explore on clustering large database and explain K-means clustering algorithm
ACS014.18	Understand the clustering with categorical Attributes and comparison with other data types.

ACS014.19	Understand the clustering large databases and explain clustering methods
ACS014.20	Describe clustering with categorical attributes and explain KNN

MAPPING OF SEMESTER END EXAMINATION TO COURSE LEARNING OUTCOMES:

SEE Question Number		COURSE LEARNING OUTCOME		Course Outcomes	Blooms Taxonomy Level
1	a	ACS014.01	Understand the concept of learning and candidate elimination algorithms	CO 1	Understand
	b	ACS014.02	Explore on different types of learning and explore On tree based learning.	CO 1	Remember
2	a	ACS014.03	Understand the construction process of decision trees used for classification problem.	CO 1	Remember
	b	ACS014.04	Understand the concept of perception and explore on forward and backward practices.	CO 1	Understand
3	a	ACS014.08	Understand the concepts of Bayes theorem and Bayes optimal classifiers	CO 2	Remember
	b	ACS014.07	Understand the concepts of Gaussian and bias-variance tradeoff.	CO 2	Remember
4	a	ACS014.08	Understand the concepts of Bayes theorem and Bayes optimal classifiers.	CO 2	Understand
	b	ACS014.10	Explore on Evolutionary learning techniques used in genetic algorithms.	CO 2	Remember
5	a	ACS014.11	Illustrate the ensemble learning approaches used in bagging and boosting.	CO 3	Remember
	b	ACS014.14	Understand the outlier concept and explain about data objects	CO 3	Understand
6	a	ACS014.15	Understand the hierarchical algorithms and explain CART	CO 3	Remember
	b	ACS014.13	Explore on similarity concept and different distance measures	CO 3	Understand
7	a	ACS014.16	Understand the partitioned algorithms and explain segmentation	CO 4	Remember
	b	ACS0114.17	Explore on clustering large database and explain K-means clustering algorithm	CO 4	Remember
8	a	ACS0114.17	Explore on clustering large database and explain K-means clustering algorithm	CO 4	Understand
	b	ACS014.18	Understand the clustering with categorical Attributes and comparison with other data types.	CO 4	Understand
9	a	ACS014.19	Understand the clustering large databases and explain clustering methods	CO 5	Understand
	b	ACS014.20	Describe clustering with categorical attributes and explain KNN	CO 5	Remember
10	a	ACS014.19	Understand the clustering large databases and explain clustering methods	CO 5	Understand
	b	ACS014.20	Describe clustering with categorical attributes and explain KNN	CO 5	Remember

Signature of Course Coordinator **HOD, CSE**