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

## INFORMATION TECHNOLOGY

**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, IT**