Code No: 117EF **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, February/March - 2022
MACHINE LEARNING
(Computer Science and Engineering)

Time: 3 Hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks
- - -

1. With the help of an example explain in detail about PAC model. [15]
2. Give an example to explain the candidate elimination algorithm. [15]
3. Define decision trees? Explain the process of classification using decision tree. [15]
4. State and explain the characteristics of back propagation networks. [15]
5. Explain how the Bayesian classification is performed using hidden Markov models. [15]
6. Illustrate the concept of multiplicative rules for weight tuning. [15]
7. List down the advantages and disadvantages of instance based learning. [15]
8. Describe in detail about the concept of explanation- based learning with an example. [15]

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R15

Code No: 127EF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, May/June - 2019
MACHINE LEARNING
(Computer Science and Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a) Define learning. [2]
b) What is the need of a target function? [3]
c) List the four steps in rule-post pruning method. [2]
d) Which is the most commonly used ANN learning technique? List its characteristics. [3]
e) Mention two practical difficulties in applying Bayesian methods. [2]
f) Provide an example of Bayesian belief network. [3]
g) Define kernel function. [2]
h) How does kNN handle the curse of dimensionality? [3]
i) Generate two off springs using mutation from 11101001000. [2]
j) State the problem of crowding in genetic algorithm application. [3]

PART-B

(50 Marks)

2. What are the various disciplines influenced machine learning? With suitable example justify your opinion. [10]

OR

3. "Concept learning is viewed as the task of searching through a large space of hypotheses implicitly defined by the hypothesis representation". Support or oppose this statement with relevant discussion. [10]

4. Define entropy and explain how information gain measures the expected reduction in entropy. [10]

OR

5.a) What is the representational power of perceptrons?
b) Differentiate between perceptron rule and delta rule. [5+5]

6.a) What is the significance of jackknife cross-validation test in machine learning?
b) How to prevent over-fitting in machine learning? [5+5]

OR

7. Demonstrate Naïve Bayesian classification of news articles. Consider any five articles of your choice. [10]

8. What are the properties shared by the instance methods, kNN and locally weighted regression? Make a comparison of these approaches with case based reasoning. [10]

OR

9. Explain how the CADET system employs case based reasoning to assist in the conceptual design of simple mechanical devices such as water faucets. [10]

10.a) State schema theorem utilized in genetic algorithm.
b) How does genetic programming handle block-stacking problem? [5+5]

OR

11.a) What is the essential difference between analytical and inductive learning methods?
b) Describe the explanation based learning algorithm, PROLOG-EBG. [5+5]

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R13

Code No: 117EF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, May/June - 2019
MACHINE LEARNING
(Computer Science and Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

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f) Provide an example of Bayesian belief network. [3]
g) Define kernel function. [2]
h) How does kNN handle the curse of dimensionality? [3]
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j) State the problem of crowding in genetic algorithm application. [3]

PART-B

(50 Marks)

2. What are the various disciplines influenced machine learning? With suitable example justify your opinion. [10]

OR

3. "Concept learning is viewed as the task of searching through a large space of hypotheses implicitly defined by the hypothesis representation". Support or oppose this statement with relevant discussion. [10]

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OR

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Code No: 117EF **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, November/December - 2017
MACHINE LEARNING
(Computer Science and Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a) Define learning. [2]
b) What is the influence of information theory on machine learning? [3]
c) What is an active query? [2]
d) List the characteristics of problems for which decision tree learning is best suited. [3]
e) State Baye's theorem. [2]
f) Differentiate between sample error and true error. [3]
g) What are the disadvantages of instance based methods? [2]
h) What is the inductive bias of k-nearest neighbor? [3]
i) What is analytical learning? [2]
j) List the factors motivated the popularity of genetic algorithms. [3]

PART-B

(50 Marks)

2. What is meant by machine learning? What is its need to today's society? Explain successful applications of machine learning. [10]

OR

3.a) Illustrate general-to-specific ordering of hypotheses in concept learning.
b) Explain the key property of FIND-S algorithm for concept learning with necessary example. [5+5]

4. Present the basic ID3 algorithm for learning decision trees and illustrate its operation in detail. [10]

OR

5.a) Discuss the representational power of a perceptron.
b) Explain the gradient descent algorithm for training a linear unit. Implement stochastic approximation to this. [5+5]

6.a) Describe a general approach for deriving confidence intervals.
b) Explain the features of Bayesian learning methods. [5+5]

OR

7.a) With an illustrative example explain brute force MAP learning algorithm.
b) What are the applications of probably approximately correct model? Discuss in detail. [5+5]

8.a) Demonstrate k-nearest neighbor algorithm for classification.
b) Discuss the significance of locally weighted regression. [5+5]

OR

9. Explain how CADET system employs case based reasoning to assist in the conceptual design of simple mechanical devices. [10]

10. Consider the two strings as initial population for genetic algorithm and generate all possible off springs using various operators.
String 1: 11101001000
String 2: 00001010101 [10]

OR

11.a) What are the main properties of PROLOG-EBG algorithm? Is it deductive or inductive? Justify your answer.
b) Write KBANN algorithm to explain usage of prior knowledge to reduce complexity. [5+5]

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Code No: 117EF **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, November/December - 2018
MACHINE LEARNING
(Computer Science and Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a)	What can be the performance measure for checker learning program?	[2]
b)	What is a well-defined learning problem?	[3]
c)	State Minimum description length principle.	[2]
d)	Why decision trees over fit?	[3]
e)	Give example for Bayesian belief network.	[2]
f)	Differentiate between sample error and true error.	[3]
g)	What is meant by inverted deduction?	[2]
h)	Why case based reasoning is known as lazy learner?	[3]
i)	Differentiate between inductive learning and deductive learning.	[2]
j)	Give an example for mutation operator.	[3]

PART-B

(50 Marks)

2. Explain candidate-elimination learning algorithm using version space. Will this algorithm converge to the correct hypothesis? Give illustrative examples. [10]

OR

3. Discuss in detail some successful applications of machine learning. [10]

4. Describe the properties of artificial neural nets. Why are they better suited for classification of objects/inputs? [10]

OR

5. Design a two-layer network of perceptrons that implements A XOR B. [10]

6. State Baye's theorem. Explain the two roles for Bayesian methods and discuss brute force MAP hypothesis learner. [10]

OR

7. What are the problems in estimating error? Explain the concept of confidence intervals for observed hypothesis error. [10]

8. Explain locally weighted regression methods as instance-based algorithm. [10]

OR

9. When to consider nearest neighbour learning? Discuss its advantages and disadvantages. [10]

10. How to use prior knowledge to reduce space complexity? Give illustrations. [10]

OR

11. Explain how genetic algorithms can be used for learning. Explain with an example. [10]

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Code No: 117EF **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, October/November - 2020
MACHINE LEARNING
(Computer Science and Engineering)

Time: 2 Hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks
- - -

1. Explain the sequence of design choices made for checkers program in detail with illustrations. [15]

2. Discuss the limitations of FIND-S algorithm and how Candidate Elimination algorithm addresses these limitations. [15]

3. Examine the hypothesis space search performed by ID3 algorithm and contrast it with List and then eliminate algorithm. [15]

4. Describe the derivation of the gradient descent rule. [15]

5.a) How does the deviation between sample error and true error depend on the size of the data sample?
b) Discuss central limit theorem. [8+7]

6. Explain how to use Bayesian classifier to learn text classification with an example.[15]

7. Describe k-nearest neighbor algorithm for approximating a discrete-valued function.[15]

8.a) What is explanation based learning? Compare it with instance-based learning.
b) Demonstrate usage of prior knowledge to reduce the sample complexity. [8+7]

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R13

Code No: 117EF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, September - 2021
MACHINE LEARNING
(Computer Science and Engineering)

Time: 3 Hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks
- - -

1. Explain play checkers as a machine learning problem and discuss the design issues.[15]

2.a) Define general boundary and specific boundary of a hypothesis space.
b) Will the candidate elimination algorithm converge to the correct hypothesis? Justify your answer. [7+8]

3. Present the basic ID3 algorithm for learning decision trees and illustrate its operation in detail. [15]

4.a) Illustrate neural network representation used in ALVINN system.
b) What are the differences between standard gradient descent and stochastic gradient descent? [7+8]

5. Explain a procedure to estimate the difference in error between two learning methods with illustration. [15]

6.a) What is the relationship between Bayes theorem and the problem of concept learning?
b) Explain brute force MAP learning algorithm. [8+7]

7. "Nearest neighbor approaches are sensitive to the curse of dimensionality". Support this statement with suitable example. [15]

8. How genetic programming can be used to solve block stacking problem? Explain with an example. [15]

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