Code No: 155BZ **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, July/August - 2023
MACHINE LEARNING
(Common to IT, CSE(IOT))

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

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	Define Concept learning.	[2]
b)	Define Inductive Bias.	[3]
c)	Define Confidence Interval.	[2]
d)	List the general approach confidence interval steps.	[3]
e)	Define true error.	[2]
f)	What are the disadvantages of instance learning methods?	[3]
g)	Define inverse resolution operator.	[2]
h)	What are the differences between FOIL and Learn-one-Rule algorithms?	[3]
i)	Define Weakest Preimage.	[2]
j)	List the limitations and capabilities of EBL.	[3]

PART – B

(50 Marks)

2.a) Describe final design program modules of a learning system.
b) Compare and contrast Restriction and Preference Biases. [5+5]

OR

3.a) How can Partially Learned concepts be used? Discuss.
b) What type of problems are best suited for decision tree learning? [5+5]

4.a) Describe the procedure to estimate the difference in error between two learning methods L_A,L_B.
b) Compare and contrast gradient descent and stochastic gradient descent. [5+5]

OR

5.a) Suppose hypothesis h commits r = 10 errors over a sample of n=65 independently drawn examples. What is the variance and standard deviation for number of true error rate $error_D(h)$.
b) List and describe the alternate error functions. [5+5]

6.a) Derive an equation for MAP hypothesis using Bayes theorem.
b) Desribe K-Nearest Neighbour learning algorithm for continuous (real) valued target function. [5+5]

OR

7.a) What are the features of Bayesian Learning methods? Discuss the practical difficulties of applying them.
b) Explain Weighted-Majority algorithm briefly. [5+5]

8.a) Give tree representation for the function cos(x) + $\sqrt{x+y^2}$ and apply genetic programming.
b) Explain Q Learning algorithm assuming Nondeterministic rewards and actions. [5+5]

OR

9.a) Discuss the key dimensions in the design space of rule learning algorithms.
b) Describe temporal inference learning. [5+5]

10.a) Write a short note on PRODIGY.
b) Describe TangentProp algorithm. [5+5]

OR

11.a) Explain PROLOG-EBG algorithm.
b) Describe the FOCL operators with suitable examples. [5+5]

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