BTECH
(SEM-5) MACHINE LEARNING TECHNIQUES 2021-22

TIME:3 HOUR   *Total Marks: 100*

Instruction: Attempt the questions as per the given instructions. Assume missing data suitably.

SECTION - A	

Attempt *All Parts* in Brief	2*10 = 20

Q1	**Questions**	**Marks**
(a)	What is a "Well -posed Learning "problem ? Explain with an example.	2
(b)	What is Occam's razor in ML ?	2
(c)	What is the role of Inductive Bias in ANN?	2
(d)	What is gradient descent delta rule ?	2
(e)	What is Paired t-Tests in Hypothesis evaluation ?	2
(f)	How do you find the confidence interval for a hypothesis test?	2
(g)	What is sample complexity of a Learning Problem ?	2
(h)	Differentiate between Lazy and Eager Learning.	2
(i)	What is the problem of crowding in GA?	2
(j)	Comparison of purely analytical and purely inductive learning.	2

SECTION - B

Attempt _Any Three_ of the following		**3*10 = 30**
Q2	**Questions**	**Marks**
(a)	Design the Final design of checkers learning program.	10
(b)	What is Maximum Likelihood and Least Squared Error Hypothesis ?	10
(c)	What problem does the EM algorithm solve ?	10
(d)	Highlight the importance of Case Based Learning.	10
(e)	Write short notes on Learning First Order Rules.	10

SECTION - C

Attempt _Any One_ of the following		**5*10 = 50**
Q3	**Questions**	**Marks**
(a)	Explain the "Concept Learning" task giving an example.	10
(b)	Find the maximally general hypothesis and maximally specific hypothesis for the training examples given in the table using the candidate elimination algorithm.	10
Q4	**Questions**	**Marks**
(a)	Comment on the Algorithmic Generalization property of ANN.	10
(b)	Discuss the following issues in Decision Tree Learning : 1. Overfitting the data 2. Guarding against bad attribute choices 3. Handling continuous valued attributes 4. Handling missing attribute values 5. Handling attributes with differing costs	10
Q5	**Questions**	**Marks**
(a)	How is Naive Bayesian Classifier different from Bayesian Classifier ?	10
(b)	Explain the role of Central Limit Theorem Approach for deriving Confidence Interval.	10
Q6	**Questions**	**Marks**
(a)	Write short notes on Probably Approximately Correct (PAC) learning model.	10
(b)	Discuss various Mistake Bound Model of Learning.	10

Q7	Questions	Marks
(a)	What is the significance of Learn-one Rule Algorithm ?	10
(b)	Describe a prototypical genetic algorithm along with various operations possible in it.	10