

G. Narayanamma Institute of Technology & Science

(Autonomous)

(for Women)

Shaikpet, Hyderabad- 500 104

I-M.Tech II-Semester Regular Examinations, July -2019.

MACHINE LEARNING

(Digital Electronics and Communication Engineering)

Max. Marks: 70

Time: 03 Hours

Note:

1. Question paper comprises of **Part A** and **Part B**.
2. **Part A** is compulsory which carries 10 marks. Answer all questions in Part A.
3. **Part B** (for 60 marks) consists of **five questions** with **“either” “or”** pattern. Each question carries 12 marks and may have a,b,c as sub questions. The student has to answer any one full question.

PART-A

(Compulsory questions. Each question carries 2 marks)

Q.No	Question	Marks	Bloom's Level
Q.1	a) Name some of the disciplines that have influenced Machine Learning.	[02]	L1
	b) List the issues in Decision Tree Learning.	[02]	L2
	c) What are Bayes Belief Networks?	[02]	L1
	d) What are the two key difficulties that may arise in the estimation of hypothesis accuracy?	[02]	L1
	e) Distinguish between inductive and analytical learning methods.	[02]	L2

END OF PART A

PART-B

(Answer any 05 full questions. Each question carries 12 marks)

Q.No	Question	Marks	Bloom's Level
Q.2(a)	What do you mean by Machine Learning? List some successful Machine Learning applications?	[06]	L1
(b)	What are the basic design issues and approaches of machine learning? Briefly explain.	[06]	L1
	OR		
Q.3(a)	Consider the following sequence of +ve and -ve training examples describing the concept of “people who live in the same house”. Each training example describes an ordered pair of people, with each person described by their <i>sex</i>, hair color(black, brown or blonde), <i>height</i> (tall, medium, or short) and <i>nationality</i> (US, French, German, Irish, Indian, Japanese, or Portuguese): + <<male brown short French><female black short US>> - <<female brown tall German><female black short Indian>> + <<male brown tall US><female black short US>> + <<male brown tall Irish><female brown short Irish>> Consider a hypothesis space defined over these instances, in which each hypothesis is represented by a pair of 4-tuples, and where each attribute constraint may be a specific value, “?”, or “Φ,” just as in the Enjoy Sport hypothesis representation. For example, the hypothesis <<male ? tall ? > <female ? ? Japanese>> Represents the set of all pairs of people where the first is a tall male(of any nationality and hair color), and the second is a Japanese female (of any hair color and height) i) Provide a hand trace of the Candidate-Elimination algorithm learning from the above training examples and hypotheses language. Show the specific and general boundaries of the version space after it has processed the 1st training example, then 2nd training example? ii) How many distinct hypotheses from the given hypothesis space are consistent with the following single positive example? + <<male black short Portuguese><female blonde tall Indian>>	[06]	L3
(b)	Explain about general to specific ordering of hypothesis with suitable example.	[06]	L2
Q.4(a)	List and briefly explain the characteristics of the problems where Decision Tree Learning is best suited?	[06]	L2
(b)	How does ID3 algorithm build decision tree? Explain with a suitable example.	[06]	L2
	OR		
Q.5(a)	What is a MAP hypothesis? How Maximum Likelihood hypotheses used for probability prediction?	[06]	L3
(b)	Explain Bayes Optimal Classifier with a suitable example.	[06]	L2

Q.6(a)	Compare and contrast between PAC and mistake bound learning models.	[06]	L2
(b)	State and explain about the Weighted-Majority algorithm.	[06]	L2
OR			
Q.7(a)	List the advantages and disadvantages of instance based learning techniques.	[06]	L2
(b)	Explain k-Nearest Neighbor learning algorithm with a suitable example.	[06]	L2
Q.8(a)	Distinguish between sampling error and true error.	[06]	L4
(b)	What is central limiting theorem? Briefly explain.	[06]	L1
OR			
Q.9(a)	What are sequential covering algorithms? Briefly explain.	[06]	L2
(b)	What are the different functions used for the evaluation of rule performance? Briefly explain.	[06]	L2
Q.10(a)	What is FOCL? Briefly explain.	[06]	L1
(b)	What are the different uses of prior knowledge in purely inductive methods?	[06]	L3
OR			
Q.11(a)	Explain Q-learning algorithm.	[06]	L2
(b)	What is reinforced learning? Briefly explain.	[06]	L1

END OF PART B**END OF THE QUESTION PAPER**