P P SAVANI UNIVERSITY

3rd Semester of M.Sc. DS Examination

January 2023

SSDM8012 Machine Learning

03.01.2023, Tuesday **Time: 10:00 a.m. To 12:30 a.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in same answer sheet.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

	SECTION – I		CO	BTL
Q - 1	**Define: (Any Five)**	**[05]**	**1**	**1**
(i)	Learning			
(ii)	LMS weight update rule			
(iii)	Version Space			
(iv)	Consistent Hypothesis			
(v)	General Boundary			
(vi)	Specific Boundary			
(vii)	Concept			
Q - 2 (a)	What are the basic design issues and approaches to machine learning?	**[05]**	**1**	**2**
Q- 2 (b)	Explain the various stages involved in designing a learning system	**[05]**	**1**	**2**
	OR			
Q - 2 (a)	What are the issues in Machine Learning?	**[05]**	**1**	**2**
Q – 2 (b)	Differentiate between Supervised, Unsupervised and Reinforcement Learning.	**[05]**	**1**	**3**
Q - 3	Relate Inductive bias with respect to Decision tree learning.	**[10]**	**1**	**3**
	OR			
Q - 3	Derive the Backpropagation rule considering the training rule for Output Unit weights and Training Rule for Hidden Unit weights.	**[10]**	**2**	**3**
Q - 4	**Attempt anyone.**	**[05]**		
(i)	Explain multi-Layer Feed Forward neural network.		**1**	**2**
(ii)	Discuss the applications of neural network.		**2**	**3**

	SECTION – II			
Q - 1	**Define Following: (Any five)**	**[05]**	**1**	**1**
(i)	Prior Probability			
(ii)	Conditional Probability			
(iii)	Posterior Probability			
(iv)	Regression			
(v)	Residual			
(vi)	Kernel Function			
(vii)	Sample error			
Q - 2 (a)	Explain the concept of Bayes theorem with an example.	**[05]**	**1**	**3**

Q - 2 (b)	Explain Bayes Optimal Classifier.	[05]	1	3
	OR			
Q - 2 (a)	What are Bayesian Belief nets? Where are they used?	[05]	1	3
Q - 2 (b)	Explain Brute force MAP hypothesis learner? What is minimum description length principle.	[05]	2	3
Q - 3 (a)	Explain Brute force Bayes Concept Learning.	[05]	2	3
Q - 3 (b)	Explain the concept of EM Algorithm.	[05]	1	3
	OR			
Q - 3 (a)	Discuss Maximum Likelihood and Least Square Error Hypothesis.	[05]	2	3
Q - 3 (b)	Describe Maximum Likelihood Hypothesis for predicting probabilities.	[05]	1	3
Q - 4	**Attempt any one**	[05]		
(i)	Describe K-nearest Neighbour learning Algorithm for continues valued target function.		1	3
(ii)	Discuss the major drawbacks of K-nearest Neighbour learning Algorithm and how it can be corrected.		1	3

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CO: Course Outcome Number BTL: Blooms Taxonomy Level

Level of Bloom's Revised Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create