Program:	S.Y.B.Sc DS	**Semester:**	III	**Program Code:**	UGDS03
Course:	Supervised Machine Learning			**Course Code:**	NUDS302
Duration:	1 Hour	**Examination Pattern:**	NEP-Autonomous - External.	**Max. Marks:**	30

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat diagrams wherever necessary.
4. CO (Course Outcome), KL (Knowledge Level).

Examination:

REGULAR

Q. 1		**Attempt any TWO of the following.**	[10]	CO's	KL's
	(a)	State the main difference between regression and classification in machine learning.		CO1	L1
	(b)	Explain the different types of linear regression and describe the key characteristics of each type.		CO2	L2
	(c)	Analyze the Decision Tree algorithm by examining its structure, decision-making process, and splitting criteria, and represent the process using a neat labeled diagram.		CO2	L4
	(d)	What is logistic regression? Explain its different types and state the assumptions of logistic regression.		CO2	L2
Q. 2		**Attempt any TWO of the following.**	[10]	CO's	KL's
	(a)	List the common algorithms used in ensemble learning.		CO4	L1
	(b)	Apply K-Fold Cross-Validation to a given dataset and demonstrate the procedure with a suitable example.		CO3	L3
	(c)	Evaluate the different types of Support Vector Machines (SVMs) and justify their suitability for different classification problems.		CO2	L5
	(d)	Explain the concept of cross-validation and describe the commonly used cross-validation techniques.		CO3	L2
Q. 3		**Attempt any TWO of the following.**	[10]	CO's	KL's
	(a)	Analyze the main steps involved in supervised machine learning and explain how each step contributes to the overall learning process.		CO1	L4
	(b)	Explain supervised learning and describe why labeled data is important for training a supervised learning model.		CO1	L2
	(c)	Analyze the techniques used to handle imbalanced data in machine learning and compare their suitability for different classification problems.		CO3	L4
	(d)	Define Random Forest and list its main steps of operation.		CO4	L1

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