RV College of Engineering®
Mysore Road, RV Vidyaniketan Post,
Bengaluru - 560059, Karnataka, India

Go, change the world

Academic year 2024-2025 (Odd Sem)

Date	27/01/2025	Maximum Marks	50+10
Course Code	IS353IA	Duration	90+30
Sem	V	CIE III	
UG/~~PG~~	UG	Faculty: MEM/AS/VH/VG/JS/SHRS/ARA	

Artificial Intelligence and Machine Learning
(Common to AIML/CSE/CD/CY/ISE)

Note: - Students need to add comments to their answers wherever required.

	QUIZ.	M	BT	CO
1.	Consider a data given below (Fig 01), points drawn from ***sin*** curve and adding some noise to them.  Fig 01 Explain the concept of model selection, while emphasizing concepts of ***Under fitting***	2	L3	CO2
2.	For the same figure (Fig 01), Explain the concept of model selection, while emphasizing concepts of **Over fitting**	2	L1	CO1
3.	Define Cohesion and separation of clustering.	2	L1	CO1
4	In bagging base classifiers need to run in series, while in boosting base classifiers should run in parallel.	2	L2	CO2
5.	How does the presence of a large number (> 80%) of irrelevant features in the input data affect the performance of Random Forests?	2	L3	CO2
Q. No.	**Questions**	**M**	**BT**	**CO**
1. A	What does the utility function of a game represent? Using the concept of the utility function, explain why a game is referred to as a zero-sum game.	5	L2	CO1
B	Explain the Alpha-Beta Pruning algorithm with a suitable example. Discuss how it improves the efficiency of the Minimax algorithm.	5	L2	CO2
2. A	What is the generalization error of a classification model? How do ensemble methods enhance the classification accuracy of the base model?	5	L1	CO5
B	What is Bagging? Explain how it works	5	L2	CO2
3. A	Provide an overview of the AdaBoost algorithm, outline its steps (Algorithm), and explain how the weights are adjusted in the AdaBoost mechanism. (Boosting)	10	L2	CO2
4. A	A dataset is classified using three different classifiers (C1, C2, and C3) in an ensemble method. The classifiers' predictions and the actual labels are given below:	05	L3	CO2

		Instance	Actual Label	C1 Prediction	C2 Prediction	C3 Prediction			
		1	1	1	1	0	1		
		2	0	0	1	0	0		
		3	1	1	0	1	1		
		4	0	0	0	0	0		
		5	1	1	1	1	1		
		Using a majority voting ensemble method, determine the final predictions for each instance. Calculate the accuracy of the ensemble model and compare it with the accuracy of individual classifiers.							
	B	What is cluster analysis? Explain the different types of clustering techniques.					**05**	L2	CO5
5.	A	Explain the basic K-means algorithm with a step-by-step example.					**05**	L1	CO2
	B	Explain how cohesion and separation are used for unsupervised cluster *evaluation.*					**05**	L3	CO2

****

Blooms Taxonomy, CO-Course Outcomes

Marks Distribution	Particulars		CO1	CO2	CO3	CO4	CO5	L1	L2	L3	L4	L5	L6
	Test	Max Marks	9	41	-	-	10	14	32	14	-	-	-

Course Outcomes:	
CO1:	Explain and apply AI and ML algorithms to address various requirements of real-world problems.
CO2:	Design and develop AI and ML solutions to benefit society, science, and industry.
CO3:	Use modern tools to create AI and ML solutions.
CO4:	Demonstrate effective communication through team presentations and reports to analyze the impact of AI and ML solutions on society and nature.
CO5:	Conduct performance evaluation, modeling, and validation of AI and ML solutions benefiting lifelong learning.