Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 120008

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2025
Fifth Semester
Biomedical Engineering
U19BMV18 - MACHINE LEARNING TECHNIQUES IN MEDICINE
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Define Machine Learning.	2	K1	CO1
2.	Name any two machine learning algorithms.	2	K2	CO1
3.	Define the term machine learning cycle.	2	K1	CO2
4.	Give the significance of data quality in machine learning.	2	K1	CO2
5.	What is a decision tree?	2	K1	CO3
6.	State Bayes' theorem.	2	K2	CO3
7.	Define the term Motion management in radiotherapy.	2	K2	CO4
8.	What is meant by image-based motion correction?	2	K2	CO4
9.	List the methods to detect objects in hematological cytology.	2	K1	CO5
10.	Name any two objects that are classified in blood smear analysis.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Apply machine learning concepts to design a basic spam detection system.	13	K2	CO1

(OR)

	b)	Analyze the role of human intervention in machine learning models.	13	K2	CO1
12.	a)	Evaluate the impact of data quality on the performance of ML models.	13	K2	CO2
		(OR)			
	b)	Explain the process of data cleaning in preparing data for a machine learning model.	13	K2	CO2
13.	a)	Analyze the limitations of decision trees and propose enhancements using probabilistic models.	13	K3	CO3
		(OR)			
	b)	Apply Bayes' theorem to calculate conditional probabilities in a medical diagnosis scenario.	13	K3	CO3
14.	a)	Discuss the advancements in radiotherapy through ML-based motion correction techniques.	13	K4	CO4
		(OR)			
	b)	Analyze the challenges of implementing ML models in clinical radiotherapy settings.	13	K4	CO4
15.	a)	Describe the recent advancements in ML applications for hematological diagnostics.	13	K4	CO5
		(OR)			
	b)	Apply ML techniques to automate the detection of abnormal cells in microscopic images.	13	K3	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	A hospital has collected data on patients discharged after surgery. The dataset includes attributes such as: * Age * Length of hospital stay * Type of surgery * Comorbidities (e.g., diabetes, hypertension) * Discharge medications * Follow-up compliance * Whether the patient was readmitted within 30 days Describe the steps involved in building decision tree. Illustrate a sample decision tree structure showing possible decision nodes and outcomes.	15	K3	CO3
		(OR)			

b)	A diagnostic lab wants to reduce manual errors in identifying leukemia from blood smear images. They have a dataset's of thousands of labeled microscopic images of blood cells, annotated with: * Cell type (RBC, WBC, Platelets) * Presence of abnormal white blood cells * Morphological features (size, shape, nucleus count) Discuss the methods to detect, classify and measure objects in hematological cytology.	15	K4	CO5