Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

MEDICAPS UNIVERSITY

Faculty of Engineering
End Sem Examination May 2025
EE3CO47 Machine Learning for Electrical Engineering

Programme: B.Tech. Branch/Specialisation: EE

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	CO	BL
Q.1	i.	Examples of supervised machine learning tasks include- (a) Identifying the zip code from handwritten digits on an envelope (b) Determining whether a tumor is benign based on a medical image (c) Detecting fraudulent activity in credit card transactions (d) All of these	**1**	**1**	**1**
	ii.	Machine learning algorithms that learn from input/output pairs are called- (a) Unsupervised learning algorithms (b) Supervised learning algorithms (c) Non learning algorithms (d) None of these	**1**	**1**	**1**
	iii.	Major type of supervised machine learning problem is- (a) Classification (b) Regression (c) Both (a) and (b) (d) None of these	**1**	**2**	**2**
	iv.	K-NN (K- nearest neighbor) comes under which type of machine learning- (a) Instance based (b) Paramatric (c) Non Paramatric (d) Model-based learning	**1**	**2**	**2**

v.	High dimensional datasets have: (a) Datasets with many features (b) Datasets with few features (c) Datasets with no features (d) None of these		**1**	**1**	**1**
vi.	Clustering comes under- (a) Supervised learning (b) In Supervised learning (c) Non learning (d) None of these		**1**	**1**	**1**
vii.	Categorical features is also known as: (a) continuous feature (b) discrete features (c) Both (a) & (b) (d) None of these		**1**	**2**	**2**
viii.	Which supervised machine learning model is used to judge the importance of each feature and keeps only the most important ones. (a) Decision tree–based feature selection (b) Model-based feature selection (c) Random forest classifier (d) None of these		**1**	**2**	**2**
ix.	Type of string data- (a) Categorical data (b) Structured string data (c) Text data (d) All of these		**1**	**1**	**1**
x.	One of the most simple but effective and commonly used ways to represent text for machine learning is using the- (a) Paragraphs representation (b) Bag-of-words representation (c) Sentences representation (d) Formatting representation		**1**	**2**	**2**
Q.2	i.	Define machine learning.	**2**	**1**	**1**
	ii.	Explain NumPy and SciPy with the help of examples.	**8**	**2**	**2**
OR	iii.	Explain the terms “Making Predictions” and “Evaluating the Model” with respect to machine learning with the help of examples.	**8**	**2**	**2**
Q.3	i.	Mention different types of supervised learning along with examples.	**3**	**2**	**2**

	ii.	Illustrate the k-Nearest Neighbors supervised machine learning algorithms along with example. Also mention the strengths and weaknesses.	**7**	**2**	**2**
OR	iii.	Illustrate the decision trees supervised machine learning algorithms along with example. What is ensembles of decision trees, explain.	**7**	**2**	**2**
Q.4	i.	What are different types of challenges in unsupervised learning, explain.	**3**	**2**	**2**
	ii.	Illustrate the concept of manifold learning. Discuss in detail.	**7**	**3**	**3**
OR	iii.	Illustrate the concept of clustering. Explain agglomerative clustering in detail.	**7**	**3**	**3**
Q.5	i.	What are categorical variables, Explain.	**3**	**2**	**2**
	ii.	Eloborate the concept of automatic feature selection. Explain in detail.	**7**	**3**	**4**
OR	iii.	Write short note on univariate nonlinear transformations.	**7**	**3**	**4**
Q.6		Attempt any two:			
	i.	Write a note on sentiment analysis of movie reviews.	**5**	**2**	**2**
	ii.	Demonstrate the concept of rescaling the data with tf-idf.	**5**	**4**	**5**
	iii.	What is investigating model coefficients, Discuss in detail with examples.	**5**	**4**	**5**

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Marking Scheme

EE3CO47/ EX3CO47(T) Machine Learning for Electrical Engineering

Q.1	i)	All of the above	**1**
	ii)	Supervised learning algorithms	**1**
	iii)	Both (a) and (b)	**1**
	iv)	a) Instance bord learning	**1**
	v)	a) Datasets with many features	**1**
	vi)	d) None of the above	**1**
	vii)	discrete features	**1**
	viii)	Model-based feature selection	**1**
	ix)	All of the above	**1**
	x)	bag-of-words representation	**1**
Q.2	i.	Define machine learning. – 2 marks	**2**
	ii.	Explain NumPy with the help of examples. – 4 marks Explain with the help of examples. – 4 marks	**8**
OR	iii.	Explain the terms “Making Predictions” with the help of examples. – 4 marks Explain the terms “Evaluating the Model” with the help of examples. – 4 marks	**8**
Q.3	i.	Mention different types of supervised learning along with examples. – 3 marks	**3**
	ii.	Explain k-Nearest Neighbors supervised machine learning algorithms along with example. – 5 marks Mention the strengths and weaknesses. – 2 marks	**7**
OR	iii.	Explain decision trees supervised machine learning algorithms along with example. – 5 marks What is ensembles of decision trees, explain. – 2 marks	**7**
Q.4	i.	challenges in unsupervised learning, explain. – 3 marks	**3**
	ii.	What is manifold learning. Discuss in detail. – 7 marks	**7**
OR	iii.	What is clustering. – 2 marks Explain agglomerative clustering in detail. – 5 marks	**7**
Q.5	i.	What are categorical variables, Explain. – 3 marks	**3**
	ii.	What is automatic feature selection. Explain in detail. – 7 marks	**7**
OR	iii.	Write short note on univariate nonlinear transformations. – 7 marks	**7**
Q.6			
	i.	Write a note on sentiment analysis of movie reviews. – 5 marks	**5**
	ii.	Explain the concept of rescaling the data with tf-idf. – 5 marks	**5**
	iii.	What is investigating model coefficients, Discuss in detail. – 5 marks	**5**

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