

Model Question Paper-1/2 with effect from 2021(CBCS Scheme)

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7th Semester B.E. Degree Examination

Subject Title : Machine Learning with Python

TIME: 03 Hours

Max. Marks: 100

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Module -1			*Bloom's Taxonomy Level	COs	Marks
Q.01	a	Discuss types of Machine Learning with examples.	L1	1	10M
	b	Illustrate the adaptive linear neurons(Adaline) in Machine Learning system	L2	1	10M
OR					
Q.02	a	Describe the process in building machine learning systems.	L1	1	10M
	b	Illustrate the perceptron learning Rule in Machine Learning system	L2	1	10M
Module-2					
Q. 03	a	Describe how to train a perceptron using Scikit Learn	L1	2	10M
	b	Illustrate the one hot encoding on nominal features for a given data	L2	2	10M
OR					
Q.04	a	Describe implementation of Logistic Regression using Scikit Learn	L1	2	10M
	b	Illustrate the encoding class labels on supervised data.	L2	2	10M
Module-3					
Q. 05	a	Apply Principle Component Analysis on unsupervised data for dimensionality reduction	L3	3	10M
	b	Apply the bag-of-words model to the IMDb movie review dataset to convert textual data into numerical features suitable for machine learning.	L3	3	10M
OR					
Q. 06	a	Apply Linear Discriminant Analysis on supervised data for dimensionality reduction	L3	3	10M
	b	Apply a logistic regression model to the IMDb movie review dataset and classify reviews as positive or negative using the bag-of-words representation.	L3	3	10M
Module-4					
Q. 07	a	Describe how to setup on SQL Lite database for data storage.	L1	4	10M
	b	Solve for modeling nonlinear relationships in Housing dataset	L3	4	10M
OR					
Q. 08	a	Describe turning the movie classifier into web application.	L1	4	10M
	b	Solve for estimating the coefficient of a regression model via scikit learn.	L3	4	10M

Module-5					
Q. 09	a	Apply polynomial regression to extend a linear regression model into a curve and compare its performance against standard linear regression using the Housing Dataset	L3	5	10M
	b	Apply a simple linear regression model to the Housing Dataset to predict housing prices and evaluate its performance using appropriate metrics.	L3	5	10M
OR					
Q. 10	a	Apply k-means clustering algorithm to group objects by similarity and analyse the resulting clusters.	L3	5	10M
	b	Apply an artificial neural network to model complex functions and classify handwritten digits with high accuracy.	L3	5	10M

*Bloom's Taxonomy Level: Indicate as L1, L2, L3, L4, etc. It is also desirable to indicate the COs and POs to be attained by every bit of questions.

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Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Module -1			*Bloom's Taxonomy Level	COs	Marks
Q.01	a	Illustrate minimizing cost functions with gradient descent .	L2	1	10M
	b	Describe how to implement a perceptron learning algorithm on Iris dataset	L1	1	10M
OR					
Q.02	a	Illustrate how to improve gradient descent through feature scaling	L2	1	10M
	b	Describe adaptive linear neurons (Adaline) with minimizing cost functions with gradient descent.	L1	1	10M
Module-2					
Q. 03	a	Apply pre-processing techniques to clean a given dataset having missing values.	L3	2	10M
	b	Describe maximum margin classification with support vector machine with example.	L1	2	10M
OR					
Q.04	a	Apply k-NN algorithm to classify multiclass -unsupervised data.	L3	2	10M
	b	Describe how to handle categorical data with example .	L1	2	10M
Module-3					
Q. 05	a	Apply the bag-of-words model to the IMDb movie review dataset to convert textual data into numerical features suitable for machine learning.	L3	3	10M
	b	Explain confusion matrix, precision , recall ,F1 score ,ROC with example	L1	3	10M
OR					
Q. 06	a	Apply a logistic regression model to the IMDb movie review dataset and classify reviews as positive or negative using the bag-of-words representation.	L3	3	10M
	b	Describe the process of k-fold cross-validation . Why it is preferred over a single train-test split ?	L1	3	10M
Module-4					
Q. 07	a	Describe the key components and workflow of developing a web application using flask.	L1	4	10M
	b	Apply regularization techniques such as ridge regression ,lasso regression to address overfitting in a regression model.	L3	4	10M

OR					
Q. 08	a	Describe deploying the web application to public server.	L1	4	10M
	b	Apply RANSAC algorithm to fit a robust regression model on a dataset and discuss its ability to handle outliers and improve model performance .	L3	4	10M
Module-5					
Q. 09	a	Apply polynomial regression to extend a linear regression model into a curve and compare its performance against standard linear regression using the Housing Dataset	L3	5	10M
	b	Apply a simple linear regression model to the Housing Dataset to predict housing prices and evaluate its performance using appropriate metrics.	L3	5	10M
OR					
Q. 10	a	Apply k-means clustering algorithm to group objects by similarity and analyse the resulting clusters.	L3	5	10M
	b	Apply with different neural network architectures to improve performance on handwritten digit classification tasks.	L3	5	10M

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7th Semester B.E. Degree Examination Machine Learning with Python

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Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Module -1			*Bloom's Taxonomy Level	COs	Marks
Q.01	a	Explain the different types of learning.	L2	CO1	8
	b	Discuss the roadmap for building machine learning systems.	L2	CO1	7
	c	Explain the biological neuron with a neat diagram.	L2	CO1	5
OR					
Q.02	a	Explain the different types of learning.	L2	CO1	8
	b	Explain the Adaptive linear neurons and the convergence of learning.	L2	CO1	7
	c	Explain the biological neuron with a neat diagram.	L2	CO1	5
Module-2					
Q. 03	a	Explain the concepts overfitting and underfitting problem in machine learning.	L2	CO1	8
	b	How does Logistic Regression handle multi-class classification?	L2	CO1	7
	c	What are L1 and L2 regularization, and when would you use them?	L2	CO4	5
OR					
Q.04	a	What is the geometric interpretation of the "margin" in SVMs?	L2	CO3	8
	b	Demonstrate k- Nearest Neighbors with example.	L2	CO4	7
	c	Why are kernels used in SVMs?	L2	CO4	5
Module-3					
Q. 05	a	Discuss principal component analysis method.	L2	CO1	8
	b	Explain the inner workings of linear discriminant analysis.	L2	CO1	7
	c	Interpret how to assess feature importance with random forests?	L2	CO1	5
OR					
Q. 06	a	Explain partitioning a dataset into training and test dataset.	L2	CO3	8
	b	How to deal with missing data and categorical data?	L2	CO3	7
	c	Discuss about bag of words	L2	CO4	5
Module-4					
Q. 07	a	Develop a python code to create a new SQLite database inside the movieclassifier directory and store two example movie reviews.	L3	CO3	10
	b	Explain the mathematical formulation of a simple linear regression model with a neat diagram.	L2	CO3	10
OR					
Q. 08	a	Describe the algorithmic steps involved in fitting a robust regression model using RANSAC.	L2	CO2	10
	b	What metrics are commonly used to evaluate the performance of linear regression models? Discuss their significance.	L2	CO2	10
Module-5					
Q. 09	a	What is the k-means clustering algorithm, and how does it group objects based on similarity?	L2	CO2	10
	b	What is hierarchical clustering, and demonstrate the working with the help of an example?	L2	CO2	10

OR					
Q. 10	a	Explain the working of multilayer neural network architecture.	L2	CO3	8
	b	Explain the process of backpropagation and how it updates weights during training.	L2	CO4	7
	c	What is the MNIST dataset, and why is it widely used in digit classification tasks?	L2	CO4	5

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