MACHINE LEARNING FOR CIVIL ENGINEERS

1	What is Probability?
2	List the types of Probability
3	How does Machine Learning differ from Deep Learning?
4	Why machine learning is important for Civil Engineers?
5	Give the types of Probability Distribution
6	Define Probability.
7	In a simultaneous toss of 2 coins, then find the probability of 2 tails?
8	How does Machine Learning differ from Artificial Intelligence?
9	Illustrate the objectives of Probability.
11	In a single throw of 2 dice, find the probability of getting a total of 3 or 5.
12	Define Regression Analysis.
13	What is linear regression and how is it different from other types of Regression analysis?
14	How does a Gaussian Process regression model make predictions?
15	What are the key differences between supervised and unsupervised Learning?
16	List out some real-world applications of supervised learning?
17	Define Linear Regression Analysis.
18	What is a Gaussian Process in regression analysis?
19	How does a Gaussian Process regression model make predictions?
20	Illustrate the objectives of Supervised learning
21	Analyse the purpose of training data in supervised learning?
22	Define Reinforcement Learning
23	List the types of rewards used in Reinforcement Learning and why?
24	How K-Means Clustering can be used in ML.
25	Analyse the purpose of Agent in Reinforcement Learning.
26	How Tensor flow works?
27	How is reinforcement learning different from supervised and unsupervised learning?
28	Why training data in supervised learning should be analysed?
29	Analyse the main features and functions of MATLAB that make it appropriate for machine learning?
30	List out the different software used in Machine learning
31	What is Weka and what is its purpose in machine learning?
32	What makes machine learning important for Civil Engineers?

33	Differentiate Machine Learning and Deep Learning?
34	Define Linear Regression Analysis.
35	How does linear regression differ from other methods of regression analysis?
36	What predictions could a regression model make using the Gaussian Process ?
37	Give examples of the supervised learning's goals.
38	What does supervised learning's training data analysis encompass?
39	What is the value of information in the context of machine learning and why is it important?
40	How to apply K-Means Clustering in machine learning.
41	What distinguishing qualities and capabilities of MATLAB make it a good choice for machine learning?

14 MARKS

1	Examine the variables that affect machine learning's significance in civil engineering.
2	(i) Four coins are tossed once. Find the probability of exactly 3 tails. (ii) Four coins are tossed once. Find the probability by atleast of 1 tail.
3	Illustrate the applications of machine learning in Civil Engineering field.
4	Give the brief explanation of Structure od Decision theory.
5	Explain briefly about types of Probability Distribution.
6	Show the meaning of Statistical Decision theory and explain with example.
7	Examine the various types of regression algorithms with example
8	How Data Collection and Preprocessing is done in Soil Contaminant Characterization.
9	Illustrate the different types of machine learning techniques.
11	Give the brief explanation of application of GPR in Civil Engineering
12	Explain Applications of Regression in Civil Engineering
13	How Gaussian process regression is used in machine learning with example
14	Examine the different Steps in Linear Regression
15	Explain different machine learning techniques.
16	Illustrate the applications of Linear regression in Civil Engineering field.
17	How Model Training and Evaluation is performed in Soil Contaminant Characterization.
18	Explain briefly the applications of Soil Contaminant Characterization with Machine learning
19	Explain the Application of Linear Regression in Civil Engineering

20	How does PCA help in reducing the dimensionality of a dataset containing multiple correlated features?
21	Explain Reinforcement Learning and its process in Machine Learning.
22	Analyse the machine learning techniques used in MAT LAB.
23	Give the brief explanation of application of GPR in Civil Engineering
24	Examine the Principal Component Analysis and Dimension Reduction.
25	Explain Reinforcement Learning and its process in Machine Learning.
26	Illustrate the different types of software used machine learning techniques.
27	Give the brief explanation of application of Tensor flow in Civil Engineering
28	Explain Applications of MAT LAB in Civil Engineering
29	Analyse any one case study in Civil Engineering using Machine Learning Theory.
30	Examine the use of machine learning in the field of civil engineering. Describe in detail.
31	(i) Four coins are tossed once. Find the probability of exactly 3 tails. (ii) Four coins are tossed once. Find the probability by atleast of 1 tail.
32	How to utilise a machine learning example to demonstrate the use of Gaussian process regression.
33	How Data Collection and Preprocessing is done in Soil Contaminant Characterization.
34	
35	What is K-means? Explain its objectives, role, advantages, disadvantages and applications of the k-means algorithm in Machine Learning?
36	Describe how Principal Component Analysis and Dimension Reduction are used in unsupervised learning.
37	
38	How do decision-making in machine learning algorithms change depending on the value of the information? Describe using examples from civil engineering.
39	Discuss the advantages of reinforcement learning in applications for civil engineering. How can the effectiveness and accuracy of structural analysis be increased using reinforcement learning techniques?
40	
41	Provide a brief explanation of MATLAB's uses in machine learning and a relevant illustration.
42	Describe one example of a civil engineering case study utilising machine learning theory.