

2025

M.Sc. 3rd Semester Examination

PAPER : M250302 (MOOCS)

**MACHINE LEARNING WITH PYTHON
FOR MANAGERS**

Full Marks : 100

Time : Three Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Group - A

Answer any *nine* questions : $2 \times 9 = 18$

1. What are the key characteristics of Machine Learning (ML)?
2. Write the name of components of time series.
3. What is the importance of clustering in Data Analysis?
4. What are the output of the following Python code :

a, b = 10,3

print(a/b)

print(a%b)

print(a>=b)

print(a&b)

P.T.O.

(2)

5. What is Support Vector Machine (SVM)?
6. Write short note on 'Binary Classification'.
7. What is the difference between classification and regression?
8. What is an identifier in Python?
9. What is the purpose of the input () function in Python?
10. What does the coefficient of determination (R^2) indicate?
11. What is meant by the term "maximum likelihood estimation"?
12. What is the purpose of gradient descent in logistic regression?
13. What is a dendrogram?
14. What do you mean by forecasting?

Group - B

Answer any *five* questions :

4×5=20

15. Explain the bias and variance trade-off in ML model.
16. Show that loss function for linear regression with error that follows standard normal distribution is equivalent to negative logarithmic likelihood function.
17. Explain K-Nearest Neighbour (KNN) clustering algorithm with an example.
18. Explain all bitwise operators for Python with examples.

(3)

19. Write short note on the terms : "Supervised learning" and "Unsupervised learning".
20. Explain the use of conditional statements (if, elif, else) with a small Python code.
21. Distinguish among binary, multiclass, and multi-label classification with suitable examples.
22. How can forecasting errors be measured? Explain briefly.

Group - C

Answer any *four* questions : $8 \times 4 = 32$

23. Briefly explain the ML process.
24. Briefly explain the K-means clustering algorithm. What are the advantages and disadvantages of the method?
 $4+2+2$
25. What is logistic regression? When it is applied? Derive the loss function for it. Explain a solution method to minimize the loss function.
 $1+1+3+3$
26. What is the importance of data preprocessing in ML? Explain different steps of data preprocessing briefly.
 $2+6$
27. Write the advantages of Numpy and discuss the functions of Numpy as the core library in Python.

P.T.O.

(4)

28. What is Linear regression? When is it applied? Explain in detail the steps involved in building a simple linear regression model. 2+2+4

Internal Assessment : 30 marks
