

(4)

18. Write a Python program to demonstrate linear optimization using pulp.
19. Write a Python program to calculate simple reinforcement learning grid world.
20. Write a Python program to design descriptive vs predictive vs prescriptive output.

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Total No. of Printed Pages—4

SEC45CSC102(P)25 (PR)

2nd Semester Exam., 2026 (May) (FYUP)

SEC-2 (COMPUTER SCIENCE)

[Foundation of Data Science]

(Practical)

Full Marks : 100

Pass Marks : 40

Time : 3 hours

General Instructions :

1. Select 1 (one) question in each Unit.
2. Each question carries 12 marks (12×5=60) for system testing.
3. Theory (logic, algorithm, documentation) carries 5 marks (5×5=25).
4. Notebook records carry 5 marks.
5. Viva voce carries 10 marks.

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UNIT—I

1. Write a Python program to calculate mean, median, mode, range and standard deviation.
2. Write a Python program to perform Z-test for one-sample mean.
3. Write a Python program to calculate simple linear regression using least squares.
4. Write a Python program to calculate the Pearson correlation coefficient.

UNIT—II

5. Write a Python program to find K-Nearest Neighbors classifier from scratch.
6. Write a Python program to design decision tree classifier using scikit-learn.
7. Write a Python program to test the train-test split and accuracy score.
8. Write a Python program to compare model-based approach vs algorithmic approach.

UNIT—III

9. Write a Python program to find logistic regression with probability output.

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10. Write a Python program to calculate confusion matrix, precision, recall, F1 score.
11. Write a Python program to find linear discriminant analysis classification.
12. Write a Python program to find regularization effect-Ridge vs Lasso.

UNIT—IV

13. Write a Python program to find K-means clustering and plot clusters.
14. Write a Python program to implement elbow method to find optimal K.
15. Write a Python program to find hierarchical clustering dendrogram.
16. Write a Python program to find apriori association rules.

UNIT—V

17. Write a Python program to design A and B testing simulation.

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(Turn Over)