

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

May – June 2025
(B. Tech.) Program: EXTC Scheme I/II/IIB/III: <u>IIB</u>
Regular Examination: LY/ Semester: VIII
Course Code: EXDLC8034_ and Course Name: Fundamentals of Data Science__
Date of Exam: 23/05/2026
Duration: 2.5 Hours
Max. Marks: 60

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any two questions out of three: (05 marks each)	10		
a)	Explain Python identifiers, keywords, and indentation rules with examples.		CO1	U
b)	What is model evaluation?		CO3	U
c)	What is regression? Explain simple and multiple regression with examples.		CO5	U
Q 2	Solve any two questions out of three: (05 marks each)	10		
a)	For given dataset X = [12,15,18,20,22,25,28,30,35,40] calculate variance and Standard deviation.		CO2	A
b)	Explain different Data Mining techniques and their applications.		CO4	U
c)	Write a note on Python libraries used for Data Science.		CO1	U
Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	Explain in Brief Autoregressive Integrated Moving average (ARIM) and its components.		CO6	U
b)	Define overfitting and under fitting. How to evaluate a ML model for overfitting or under fitting, Explain it using diagram. What measures need to be taken in case of overfitting and under fitting?		CO5	U
c)	Following data for analysis includes the attribute salary in thousands INR, shown in increasing order: 30, 36, 47, 50, 52, 52, 56, 60, 63, 70, 70, 110. (a) calculate the mean, median, mode and midrange of the data. (b) Find first quartile, second quartile and third quartile of the data. (c) Show the boxplot of the data		CO3	A
Q.4	Solve any two questions out of three. (10 marks each)	20		
a)	Explain challenges faced in Data Mining.		CO4	U
b)	What are the types of Machine Learning? Explain each type in brief with appropriate examples. Write applications of Machine Learning.		CO4	U

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c)	For the following dataset fit a third degree polynomial regression model of the form: $Y = a + bX + cX^2 + dX^3$		CO5	A										
	<table><tr><td>X</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>Y</td><td>1</td><td>6</td><td>17</td><td>34</td></tr></table>	X	0	1	2	3	Y	1	6	17	34			
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