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M.Sc. (Sem. III) Examination October - 2025

Mathematics

Skill Based Elective Paper : Basics of Data Science

Time: 2 Hours] **[Total Marks: 30**

સૂચના : / Instructions

(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book

(2) Follow usual notations and conventions.

(3) Use of non-programmable scientific calculator is permitted.

Seat No.:

Student's Signature

Q–1. Attempt Any Three: **06**

a) Find the mode of the following distribution:

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	5	8	7	12	28	20	10	10

b) Define: Sample space

c) Find the inter quartile range from the following data:
Weekly wages: 50, 70, 80, 60, 65, 40, 90

d) The mean of marks obtained in an examination by a group 100 students was found to be 49.96. The mean of the marks obtained in the same examination by another group of 200 students was 52.32. Find the mean of the marks obtained by the both groups, of students taken together?

Q–2. Attempt Any Four: **12**

a) Calculate coefficient of correlation from the following data.

Experience (X)	16	12	18	4	3	10	5	12
Performance(Y)	23	22	24	17	19	20	18	21

b) Write the errors in hypothesis testing. Explain briefly.

c) Calculate Q_3 and P_{56}.

Wages (Rs.)	0-10	10-20	20-30	30-40	40-50
No. of workers	22	38	46	35	19

d) Calculate standard deviation and variance from the following data:

Weight in Kg.	10-20	20-30	30-40	40-50	50-60
No. of boys	3	7	10	5	3

e) Find regression coefficient of X on Y and Y on X. for the following data.

X	3	2	-1	6	4	-2	5
Y	5	13	12	-1	2	20	0

Q−3. **Attempt Any Three:** **12**

a) In a factory employing 3000 persons, 5% earn less than Rs. 3 per hour, 580 earn from Rs. 3.01 to Rs. 4.50 per hour, 30% earn from Rs. 4.51 to Rs. 6.00 per hour, 500 earn from Rs. 6.01 to Rs. 7.50 per hour, 20% earn from Rs. 7.51 to Rs. 9.00 per hour, and the rest earn Rs. 9.01 or more per hour, what is the median wage?

b) The median and mode of the following wage distribution are known to be Rs. 33.50 and Rs. 34 respectively. Find the value of f_3, f_4 and f_5

Wages (Rs.)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Total
Frequency	4	16	f_3	f_4	f_5	6	4	230

c) Explain Two Tailed and One Tailed Test of hypothesis.

d) Find out the coefficient of correlation between the sales and expenses of the following 10 firms (figures in 000' Rs.).

Firms	1	2	3	4	5	6	7	8	9	10
Sales	50	50	55	60	65	65	65	60	60	50
Expenses	11	13	14	16	16	15	15	14	13	13

e) Calculate simple and weighted arithmetic averages from the following data:

Destination	Monthly salary (in Rs.)	Strength of the cadre
Class I officers	1,500	10
Class II officers	800	20
Subordinate staff	500	70
Clerical staff	250	100
Lower staff	100	150