

Seat No. : _

DD-104

December-2024

B.B.A., Sem.-III

MDC-234 : Business Statistics

Time : 2 Hours]

[Max. Marks : 50

Instructions : Use of simple calculator is allowed.

1. (A) Define the terms with example :

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- (1) Nominal
- (2) Ordinal
- (3) Interval
- (4) Ratio

(B) Determine the class interval where Mean, Median and Mode falls :

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Class Interval	0-2	2-6	6-10	10-20	20-30	30-50
Frequency	20	30	50	10	80	20

OR

1. (A) Find coefficient of quartile deviation for the following distribution :

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Class	2-5	6-9	10-13	14-17	18-21	22-25	26-29
Cumulative Frequency	9	22	57	115	155	193	213

(B) Salaries of workers of two firms A and B is as follows, which firm is better ?

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Firm	Number of workers	Mean	SD
A	550	₹ 1,200	₹ 100
B	600	₹ 900	₹ 120

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2. (A) State the formula of Spearman's rank correlation coefficient when the observations are paired and write any 3 properties of correlation coefficient. 5

(B) The following results are obtained for two variables x and y : 5

$$n = 25, \Sigma x = 125, \Sigma y = 100, \Sigma x^2 = 650, \Sigma y^2 = 460, \Sigma xy = 508$$

On subsequent verification, it was found that one pair (8, 12) was wrongly taken.

If this pair is removed find correct value of correlation coefficient.

OR

2. (A) Find rank correlation from the following data : 5

X	40	43	45	40	47	50	45	43	45	55
Y	33	37	17	35	37	40	50	30	35	30

(B) If $r_{12} = 0.8, r_{13} = -0.4, r_{23} = -0.56, s_1 = 10, s_2 = 8, s_3 = 5$, find partial correlation coefficient of x_1 on x_2 after eliminating the linear effect of x_3 . 5

3. (A) What is regression analysis ? State four properties of regression coefficient. 5

(B) Find regression line of Y on X. 5

		Y		
		20-25	25-30	30-35
X	16-20	6	3	—
	20-24	3	—	10
	24-28	—	10	15

OR

3. (A) The equation of two lines of regression are 5

$$y = 397.33 + 4.16x \text{ and } x = -6.35 + 0.065y \text{ and the variance of } x = 21.16.$$

Find

- (1) Mean of x and y
- (2) Regression coefficients
- (3) Correlation coefficient between x and y .

(B) In a trivariate distribution, $\bar{X}_1 = 28.02, \bar{X}_2 = 4.91, \bar{X}_3 = 594, \sigma_1 = 3, \sigma_2 = 4, \sigma_3 = 5, r_{12} = 0.7, r_{13} = 0.6, r_{23} = 0.4$. Find partial regression coefficient of x_1 on x_2 after eliminating linear effect of x_3 . 5

4. (A) Obtain trend values by selecting appropriate period of moving average for the following time series : 5

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Sales ('000)	80	84	80	88	98	92	84	88	80	100
Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Sales ('000)	84	96	92	104	116	112	102	114	108	126

- (B) Fit a straight-line trend by the method of least squares to the following data : 5

Year	1995	1997	1998	1999	2000	2001	2004
Production ('000 tonnes)	77	88	94	85	91	98	90

OR

4. (A) The average monthly sale of a company is ₹ 2,00,000. The seasonal indices are as given below. Estimate the sales for different month : 5

Month	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Seasonal Indices	75	80	98	128	137	119	102	104	100	102	82	73

- (B) The short-term variation is given in the following table. Find seasonal variations : 5

Year	Season (Short Term Variation)		
	I	II	III
2003	—	80	— 60
2004	10	10	10
2005	10	50	30
2006	30	— 40	10
2007	0	— 10	—

5. Do as directed : (Any ten) 10

(Show calculation wherever necessary, No Calculation No Marks)

- (1) Weight of student follows under which data type ?

(a) Quantitative (b) Qualitative

- (2) Which data requires more time, money and labour ?

(a) Primary Data (b) Secondary Data

- (3) Spearman's rank correlation method is used for _____ data.
 (a) Quantitative (b) Qualitative
- (4) If $\sum d^2 = 0$, then there is _____ between the two variables.
 (a) No correlation (b) Perfect Positive
- (5) The regression coefficient are independent of change of Origin and Scale.
 (True/False)
- (6) Cyclical Variation may be caused by factors like strikes, floods, natural calamities etc. (True/False)
- (7) The second degree equation showing trend for the production is as follows :

$$Y = 15.46 + 0.44\left(\frac{x-2000}{2}\right) - 0.38\left(\frac{x-2000}{2}\right)^2$$
, where x shows the year.
 Estimate the production for the year 2010.
- (8) The average of each quarter of the data is 65.75, 58.25, 56.50 and 59.50. Obtain seasonal indices for second quarter.
 (a) 109.6 (b) 97.1
 (c) 94.2 (d) 99.17
- (9) In regression, least squares principle is known as the line of best fit. (True/False)
- (10) 4 faculties are ranked by one student is an example of which level of Nominal measurement ? (True/False)
- (11) What is the intersection point of two regression lines ?
- (12) If the sum of products of deviations from means of two variables is zero, what is the value of correlation coefficient ?
