

CMPAN : T&E Sem VI Reg. C'scheme Summer 2020

Total Marks 80

(3 Hours)

NB

- 1) Question **number 1** is compulsory
- 2) Attempt **any three** out of the remaining five questions.
- 3) Assume suitable data if **necessary** and justify the assumptions.
- 4) **Draw neat and clean** diagrams
- 5) Figures to the **right** indicate full marks

Q1 Attempt the following 20

- a) "Diagrams help us to visualize the whole meaning of a numerical data at a single glance". Comment.
- b) Write a note on probability sampling.
- c) Uses of Regression Analysis
- d) Explain Stratified random Sampling

Q2 a) Given that the variance of  $x = 9$  and the regression equations are 10

$8x - 10y + 66 = 0, 40x - 18y = 214$ . Find

- a)  $\bar{X}$  and  $\bar{Y}$
- b) Coefficients of correlation between  $x$  and  $y$
- c) Standard deviation of  $y$

b) What is a histogram? Draw Histogram and frequency curve for the following data: 10

Profit Range	0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120	120-135
Rs. ('000)	15	30	45	60	75	90	105	120	135
Companies	3	7	18	25	20	12	6	5	2

Q3 a) Prove that a regression line always passes through the point  $(\bar{X}, \bar{Y})$ . 10

b) Explain and give mathematical expression for : i) Consistency ii) Efficiency iii) Unbiasedness iv) Sufficiency 10

Q4 a) For the following data

10

- i) Fit a regression  $\hat{y} = a + b_1x_1 + b_2x_2$
- ii) Find the coefficient of multiple determination ( $R^2$ ).
- iii) Also test the significance of regression (Given the appropriate Table value,  $F = 13.274$ , for a significance level of  $\alpha = 0.01$ )

Sales Territory	Sales in (Lakh Rs ) y	Advt in '000 (x1)	Number of selling agents (x2)
1	200	100	50
2	80	40	15
3	75	45	10
4	100	50	20
5	125	70	19
6	50	30	13
7	70	30	20
8	130	60	28

b) What do you understand by Data collection? Compare Survey, Poll and Interviews.

10

Q5 a) What do you mean by Partial correlation coefficients? Explain in detail.

10

b) Explain in detail Null and Alternative Hypothesis

10

Q6 Write short notes on

20

- a) Uses and Limitations of Statistics.
- b) Method of moments.
- c) Multiple Regression
- d) Types of Error.

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