

G.V.M's

G.G.P.R COLLEGE OF COMMERCE & ECONOMICS

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M.Com. (Semester – III) Examination, November 2019

COO316 STATISTICS AND BASIC ECONOMETRICS

Duration : 3 Hours

Max. Marks:60

- Instructions: 1) This paper consists of nine questions carrying equal marks.  
2) Question No.1 consist of 5 compulsory questions of 2 marks each  
3) Answer any 5 questions from question 2 to 9.  
4) Each question carries 10 marks. Figures to the right indicate marks.
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Q1. Answer the following: (5x2=10)

- What is Econometrics? State any two aims of Econometric.
- Write any two differences between regression and correlation.
- What is coefficient of determination ( $R^2$ ) ?
- Why is Chi-square a test of goodness of fit?
- State any two data types used in estimation of model giving one example of each.

Q2. Explain the assumptions of CLRM and discuss the properties of OLS. (10)

Q3. a) Given the following data: (3)

$$n = 15, \sigma_x = 3.01, \sigma_y = 3.03, \bar{x} = 12, \bar{y} = 18$$
$$\Sigma(X - \bar{x})(Y - \bar{y}) = 122, \text{ Calculate coefficient of correlation.}$$

b) Fit a least square line to the following data using x as independent variable.

X:	35	6	8	9	11
Y:	23	4	6	5	8

(7)

Q4. Explain the concepts of time series. Discuss the various components of time series. (10)

Q5. a) State the addition theorem on probability. (2)

- The odds that A speaks the truth are 3:2 and the odds that B speaks the truth are 5:2. In what percentage of cases are they likely to contradict each other on an identical point.

(8)

Q6. a) If  $P(A)=1/2$  and  $P(B)=1/3$ ,  $P(A/B)=1/6$ , find  $P(A \cap B)$  and  $P(B/A)$ . (3)

b) If mean of binomial distribution is 3 and variance is  $3/2$ , find the probability of at least 4 successes. (7)

Q7. a) In a business venture a man makes a profit of ₹20000 with a probability of 0.6 or have a loss of ₹5000 with a probability of 0.4. What is his expected profit? (4)

b) The items produced by a certain machine include only one defective in every 250 items. 10 bags of 10 items are considered. Find the probability that in the 10 bags there is i) no defective item ii) exactly one defective item.

(Given:  $e^{-0.04}=0.9608$ ,  $e^{-0.4}=0.6703$ ,  $e^{-4}=0.0183$ ) (6)

Q8. The customer account of a certain departmental stores have an average balance of ₹120 and standard deviation of ₹40. Assuming the account balance are normally distributed

i) What is the percentage of account over ₹150?

ii) What is the percentage of account between ₹100 and ₹150?

(Area under SNC between  $t=0$  to  $t=0.75$  is 0.2734 and between  $t=0$  to  $t=0.5$  is 0.1915) (10)

Q9. While checking the quality of a product, one particular dimension was varying slightly due to change in machinesetting, though  $\mu$  and  $\sigma$  were not much at variation. The target value of  $\mu = 50$  and  $\sigma = 2.5$ . Dimension checked by the inspector based on sample produced gave mean 48.5. Formulate the null hypothesis and test the same at 5% level of significance. (10)

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