2022
M.Com. (E.F.B.) First Semester
FB-104: Tools for Business Research

Time allowed: 3 Hours   Max. Marks: 80

NOTE: *Attempt five questions in all, selecting atleast two questions from each Unit.*

x-x-x

Unit - I

1. a) Distinguish between simple, multiple and partial correlation. (6)
   b) Coefficient of correlation between X and Y for 20 items is 0.3. Mean of X is 15 and that of Y is 20 while standard deviations are 4 and 5 respectively. At the time of calculation, one item 27 has wrongly been taken as 17 in case of X series and 35 instead of 30 in case of Y series. Find the correct coefficient of correlation. (10)

2. a) A committee of 4 persons is to be appointed from 3 officers of the production department, 4 officers of the purchase department, two officers of the sales department and 1 chartered account. Find the probability of forming the committee in the following manner:
   i) There must be one from each category
   ii) It should have at least one from the purchase department
   iii) The chartered accountant must be in the committee. (8)
   b) A manufacturer of blades knows that 5% of his product is defective. If he sells blades in boxes of 100, and guarantees that not more than 10 blades will be defective, what is the probability (approximately) that a box will fail to meet the guaranteed quality? (8)

3. a) Why does the normal distribution hold the most honorable position in the theory of probability?
   b) Explain the distinctive features of Binomial, Normal and Poisson probability distributions. When does a Binomial distribution tend to become normal?

4. a) The number of defects per unit in a sample of 330 units of manufactured product was found as follows:

No. of defects:	0	1	2	3	4
No. of units:	214	92	20	3	1

   Fit a Poisson distribution to the data and test for goodness of fit. (Given $e^{-0.439} = 0.6447$) (8)
   b) Explain the concepts additive, multiplicative and conditional probability with suitable examples. (8)

P.T.O.

5. a) Distinguish between the census and sampling methods of data collection along with their merits and demerits. (8)

b) Distinguish clearly between sampling and non-sampling errors? How these errors can be controlled. (8)

Unit - II

6. a) The following information relates to wages of workers of two factories A an B. Test whether there is any significant difference between their mean wages.
Use X = .05.

	Factory A	Factory B
Mean Wages (`):	100	105
Standard deviation:	16	24
No. of Workers:	800	1600

(10)

b) In a hospital, 480 females and 520 male babies were born in a week. Do these figures confirm the hypothesis that males and females are born in equal number? (6)

7. What is statistical hypothesis? Discuss the procedure of testing a statistical hypothesis. (16)

8. a) A certain medicine given the each of the 9 patients resulted in the following increase in blood pressure:

7, 3, -1, 4, -3, 5, 6, -4, -1

Can it be concluded that the medicine will in general, be accompanied by an increase in blood pressure? (Given $t_{.05}$ (8)=2.0306). (10)

b) Discuss the F-test for testing the equality of two sample variances. (6)

9. a) Two salesmen A and B are working in a certain district. From a sample survey conducted by the Head Office, the following results were obtained. State whether there is any significance difference in the average sales between the two salesmen: (10)

	A	B
No. of sales	20	18
Average	170	205
Standard deviation	20	25

b) Discuss the F-test for testing the equality of two sample variances. (6)

10. a) What are non-parametric tests? In what way are they different from parametric tests? (8)

b) Write notes on any two following non-parametric test alongwith examples.

i) Sign rank test

ii) Willcoxon test

iii) Mann Witney test (8)

x-x-x