

Time: Three Hours

Maximum: 75 marks

SECTION A - (10 X 2 = 20 MARKS)

Answer ALL questions

1. Give the nature of statistics.
2. What do you mean by published source of secondary data?
3. State any two uses of correlation.
4. What is regression equation?
5. Give any two components of Time series analysis.
6. What do you mean by moving average method?
7. What is Poisson distribution?
8. What is normal distribution?
9. What is sample size?
10. What is F-Test?

SECTION B - (5 X 5 = 25 MARKS)

Answer ALL questions, choosing either (a) or (b)

11. a) Explain the growth of statistics.

OR

- b) What are the stages of statistical investigation?

12. a) Calculate the Karl Pearson's coefficient of correlation from the following data relating to the age of workers in a company and the number of days they were reported sick in a month:

Age (X)	30	32	35	40	48	50	52	55	57	61
Sick days (Y)	1	0	2	5	2	4	6	5	7	8

OR

- b) Calculate the regression equation of Y on X from the following data:

X	6	2	10	4	8
Y	9	11	5	8	7

13. a) Fit a trend line to the following data by the method of semi-averages.

Year	2009	2010	2011	2012	2013	2014	2015
Sales of firm A	112	115	124	120	118	126	122

OR

- b) Using three years moving averages determine the trend and short-term fluctuations.

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Production in tonnes	21	22	23	25	24	22	25	26	27	26

14. a) A sample of 3 items is selected at random from a box containing 12 items of which 3 are defective. Find the possible number of defective combinations of the said 3 selected items along with probability of a defective combination.

OR

- b) The mean of the Poisson distribution is 2.25. Find the other constants of the distribution.
15. a) Two types of drugs were used on 5 and 7 patients for reducing their weight. Drug A was imported and drug B indigenous. The decreased in the weight after using the drugs for six months was as follows:
- Drug A 10 12 13 11 14
Drug B 8 9 12 14 15 10 9
- Is there a significant difference in the efficiency of the two drugs? If not, which drug should you buy? (For $V=10$, $t_{0.05}=2.228$)

OR

- b) A personal manager is interested in trying to determine whether absenteeism is greater on one day of the week than on another. His records for the last year show this sample distribution:

Day of the week	First day	Second day	Third day	Fourth day	Fifth day
No. of absentees	66	57	54	48	75

Test whether the absence is uniformly distributed over the week.

SECTION C - (3 X 10 = 30 MARKS)

Answer any THREE questions

16. Explain the various defects of statistics.
17. Calculate Karl Pearson's coefficient of correlation from the following data:

X	10	12	18	24	23	27
Y	13	18	12	25	30	10

18. Fit a straight line trend through the method of least squares for the following data:

Year	2012	2013	2014	2015	2016	2017	2018
Sales	110	115	130	140	145	160	180

19. The following table shows the number of customers returning the products in a marketing territory. The data is for 100 stores:

No. of returns	0	1	2	3	4	5	6
No. of stores	4	14	23	23	18	9	9

Fit a Poisson distribution.

20. A tobacco manufacturing company appoints four salesmen R, S, T and U and observe their sales in three seasons- summer, winter and monsoon. The figures (in lakhs) are given in the following table.

Seasons	Salesman				Season's total
	R	S	T	U	
Summer	36	36	21	35	128
Winter	28	29	31	32	120
Monsoon	26	28	29	29	112
Salesmen's total	90	93	81	96	360

Do the salesmen significantly differ in performance?
