

APRIL 2021

**65159/KDA2B/KDF2C**

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Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer any TEN questions

1. Define Binomial distribution.
2. What is uncertainty?
3. Define decision tree Analysis.
4. What do you mean by Cluster Sampling?
5. Define Parameter.
6. Give meaning of hypothesis.
7. Define Chi-square Test.
8. Write note on Regression?
9. What is co-efficient of determination?
10. List out the types of correlation.
11. Define Linear Programming.
12. List any two Simple Model.

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions.

13. Explain the Importance of Binomial distribution.
14. Suppose that a manufactured product has 2 defects per unit of product Inspected using poisson distribution. Calculate the probabilities of finding a product without any defect, 3 defects and 4 defects. Given  $e^{-2}=0.135$ ).
15. Describe the Limitation of probability Sampling.
16. 500 Apples are taken at random from a Large basket and 50 are found to be bad. Estimate the proportion of bad apples in the basket and assign limits within which the percentage most probably lies.
17. A Sample of 100 tyress is taken for a lot. The Mean life of tyress is found be 39.350 kms. With a standard deviation of 3260. Could the sample come from a population. With Mean life of 40,000 kms? Establish 99% confidence limits within which the mean life of tyress is Expected to lie.
18. The following data Relate to age of employees and the numbers of days they were reported sick in a month.

	1	2	3	4	5	6	7	8	9	10
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

Find the regression of sick days on age.

19. A Dealer wishes to purchase a number of fans and ACwing Machines. He has only Rs. 5,760 to Invest and has space atmost for 20 Items. A fan costs him 360 and a sewing machine Rs. 240. His Expectation is that he can sell a fan a profit of 22 and a sewing machine at a profit of 18. Assuming that he can sell all the Items that he can buy. Solve it.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions.

20. Describe the properties of Binomial distribution.
21. 1,000 light bulbs with a mean life of 120 days are Installed in new factory their length of life is normally distributed with standard deviation 20 days  
How may bulbs will Expire in less then 90 days? If it is decided to Replace all the bulbs together what intervals should be allowed between replacements if not more than 10 percent should Expire before replacement.
22. What are the various types of Sampling?
23. Based on Information on 1,000 Randomly selected Fields about the tenancy status of the cultivation of these fields and use of fertilizers. Collected in an agro-economic survey. The following classification was noted.

	Owned	Rented	Total
Using Fertilizers	416	184	600
Not using fertilizers	64	336	400
Total	480	520	1000

Would you conclude that Owners cultivators are more Inclined towards the use of fertilizers at 5% level.

Chi-Square Test as per procedure.

24. From the following Data, apply one-way ANOVA.

Brand	Brand	Brand	Brand
A	B	C	D
42	28	24	20
30	36	36	32
39	31	28	38
28	32	28	28
29	27	33	25

At the 5% level of significance, does there appear to be a difference in mean life time among the four brands.

25. Solve the following Transportation problem.

	A	B	C	
I	50	30	220	1
II	90	45	170	3
III	250	200	50	4
	4	2	2	