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(FORTHECANDIDATES ADMITTED

DURINGTHEACADEMICYEAR2024-25 ONLY) REG.NO.: **24UAI2A1**

N.G.M. COLLEGE (AUTONOMOUS): POLLACHI

END-OF-SEMESTEREXAMINATIONS:MAY2025

B.SC (CS WITH AI &ML)SF **MAXIMUMMARKS:75**

SEMESTER: II **TIME: 3 HOURS**

PART-III

24UAI2A1-PROBABILITY AND STATISTICS

SECTION – A (10X1=10MARKS)

ANSWER THE FOLLOWING QUESTIONS. (K1)

1. The probability of getting two tails when two coins are tossed is _____
   (a)1/6(b) 1/2 (c) 1/3 (d) 1/4
2. The expected value of a random variable is equal to its _____
   (a)variance (b) standard deviation (c) means (d) covariance
3. The mean of hypergeometric distribution is _____
   a)n*k/ N-1 b)n*k-1/ N c)n-1*k/N d)n*k /N
4. Any population constant is called as:_____
   (a)statistic(b)Estimator(c) parameter(d)Estimate
5. The most common method for fitting regression line is a method of -----
   (a)Leastsquareregression(b)Nakedeye(c)Regressionline(d)Noneofthese

ANSWERTHEFOLLOWINGIN ONE(OR)TWO SENTENCES (K2)

6. Define Sample Space.
7. Define Moment.
8. State Bivariate normal distributions
9. Write the uses of ANOVA table.
10. Define Regression.

SECTION – B (5 X 5 = 25 MARKS)

ANSWEREITHER(a)OR(b)INEACHOFTHEFOLLOWINGQUESTIONS.(K3)

11. a)If A and B are independent events then $\bar{A}$ *and* $\bar{B}$ are also independent events.Prove it.

(OR)

b) If A and B are any two events such that $P(A)=\frac{1}{3}; P(A)=\frac{3}{4}; P(A\cup B)=\frac{11}{12}$ Find $(i)P\left(\frac{A}{B}\right),(ii)P\left(\frac{B}{A}\right),(iii)\ P(\bar{A}\ \cup\ \bar{B}),(iv)\ P(\bar{A}\ \cap\ \bar{B})$

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12. a)The Variance of X can be regarded as consisting of two parts, the expectation of the conditional variance and the variance of the conditional expectation.Explain it.

(OR)

b) Let f (x,y) =8xy,0<x<y<1;f(x, y) =0,elsewhere.Find (a)E(Y/X=x),(b) E(XY/X=x), (c)Var (Y/X=x).

13. a)Find Mean and Variance for uniform Distribution.

(OR)

b) An irregular 6 faced dice is such that the probability that it gives 3 even numbers in 5 throw is twice the probability it gives 2 even number in 5 thrown.How many sets of exactly 5 trails can be expected to give no even number out of 2500 set?

14. a)Determine the test of significance difference between sample mean and population mean in t-Distribution.

(OR)

b) Write the properties of F-Distribution.

15. a)Prove that correlation between lies between 1and-1.

(OR)

b) Write the properties of Regression of equation.

SECTION – C (5X8=40MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(Or)K5)

16. a)The contents of urnsI,II,and III are as follows:1white,2black, and 3red balls 2white, 1black,and 1redballs,4white,5 black,and 3red balls one urn is chosen at random and 2 balls drawn. They happen to be white and red. What is the probability that they come from urn I, II, or III?

(OR)

b)State and prove Bayes Theorem.

17. a)Calculate the first four central moment about mean of the following data:

Class interval	0-10	10-20	20-30	30-40	40-50
frequency	10	20	40	20	10

(OR)

b.State and prove Chebyshev's Theorem.

18. a)Find Mean and Variance for Binomial Distribution.

(OR)

b.Find Mean and Variance for Normal Distribution?

19. a)Sample of two type of electric bulb was tested for length of life and the following data are obtained:

	size	mean	SD
Sample1	8	1234h	36 h
Sample1	7	1036h	40 h

Is the difference in the mean sufficient to warrant that type1 bulb is superior to type2 bulb?

(OR)

b. Compute χ^2 for the 2*2 contingency table

	Smokers	Non-Smokers
Literates	83	57
Illiterates	45	68

20. a)calculate the Correlation Coefficient for the following height(in inches) of fathers(x) and their sons(y):

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

(OR)

b. Find Regression equation from the following data:

X	10	12	14	16	18	20	22	24
Y	14	18	16	22	26	28	27	30

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