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		Name : .....

SECOND SEMESTER FYUGP EXAMINATION, APRIL 2025

MINOR COURSE

STA2MN105 : INTRODUCTION TO PROBABILITY

(Credits: 4)

Time: 2 Hours **Maximum Marks: 70**

Section A

Answer the following questions. Each carries 3 marks (Ceiling: 24 marks)

1.	What is a scatter plot?	BL2	CO1
2.	What are the limits of correlation coefficient?	BL1	CO1
3.	Covariance between X and Y is 10 and variances of X and Y are respectively 4 and 5. Find the regression coefficients.	BL2	CO2
4.	State any three properties of regression coefficients.	BL1	CO2
5.	What is the sample space corresponding to throwing a coin until a tail appears?	BL2	CO3
6.	State statistical definition of probability.	BL2	CO3
7.	a) Probability always lies between _____. b) If P(A) = 0, then A is _____ event. c) P(A') = _____.	BL1	CO3
8.	P(A $\cup$ B)=0.6, P(A) = 0.4, P(B) = 0.3. Find P(A $\cap$ B), P(A | B), P(B |A).	BL3	CO3
9.	What is meant by probability distribution of a random varible?	BL2	CO4
10.	Let X be the number of tails. Write down the probability distribution of throwing two fair coins.	BL3	CO4

Section B

Answer the following questions. Each carries 6 marks (Ceiling: 36 Marks)

11.	Compute the coefficient of correlation between X and Y presented in the table below.	BL3	CO1

X	1	3	4	6	8	9	11	14
Y	1	2	4	4	5	7	8	9

12.	Explain in detail various types of correlation.	BL2	CO1

(PTO)

13.	Find the regression coefficients and hence obtain the correlation coefficient for the given data. X: 8, 6, 4, 7, 5 Y: 9, 8, 5, 6, 2	BL2	CO2
14.	Why there are two regression equations? Explain.	BL2	CO2
15.	Two 6 faced dice are thrown. Find the probability that the sum of the numbers is 7 or 9.	BL3	CO3
16.	A bag contains 7 white and 9 black balls. 3 balls are drawn together. What is the probability that: a) all are black. b) all are white. c) 1 white and 2 blacks. d) 2 white and 1 black.	BL2	CO3
17.	Find the distribution function corresponding to: x: 1, 2, 3 $P(x)$: 0.3, 0.45, 0.25	BL3	CO4
18.	Verify if $f(x) = \frac{1}{2}e^{-\frac{x}{2}},\ x > 0$ is a probability density function.	BL3	CO4

Section C

Answer any one question. Each carries 10 marks (1 x 10 = 10 Marks)

19.	Define Spearman's rank correlation coefficient and point out its advantages over Pearson's correlation coefficient. Fathers and their eldest sons are ranked according to their heights to produce the following table:- Father: 1, 3, 5, 4, 6, 11, 8, 10, 2, 7, 12, 9, 13 Son: 1, 2, 3, 4, 7, 6, 8, 13, 5, 9, 11, 12, 10 Determine the rank correlation coefficient and comment.	BL3	CO1
20.	A husband and wife appear in an interview for two vacancies in the same post. The probability of husband's selection is 1/7 and that of wife's selection is 1/5. What is the probability that (a) both of them will be selected. (b) only husband will be selected (c) only one of them will be selected (c) none of them will be selected.	BL3	CO3

CO : Course Outcome

BL : Bloom's Taxonomy Levels (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)