

21U242

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Name: .....

Reg.No: .....

**SECOND SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2022**

(CBCSS - UG)

(Regular/Supplementary/Improvement)

**CC19U STA2 C02 - REGRESSION ANALYSIS AND PROBABILITY THEORY**

(Statistics - Complementary Course)

(2019 Admission onwards)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 3

**Part A** (Short answer questions)

Answer *all* questions. Each question carries 2 marks.

1. What are the uses of Correlation?
2. Give the formula for Karl Pearson's coefficient of correlation.
3. Explain the method of finding correlation using two way table.
4. What is the meaning of zero correlation coefficient?
5. Define regression.
6. Write down the properties of regression coefficients.
7. Explain multiple regression.
8. Define a random experiment.
9. What are the axioms of probability?
10. Define independence of two random variable.
11. Write down any two real life examples for discrete and continuous random variables.
12. Define distribution function of a random variable.

**(Ceiling: 20 Marks)**

**Part B** (Short essay questions - Paragraph)

Answer *all* questions. Each question carries 5 marks.

13. Discuss the different methods for studying correlation.
14. What is a Scatter diagram? What conclusions can be drawn from it?

15. The coefficient of rank correlation of marks obtained by 10 students in two subjects was computed as 0.5. It was later discovered that the difference in marks in the two subjects obtained by one of the students was wrongly taken as 3 instead of 7. Find the correct coefficient of rank correlation.
16. What are simple, multiple and partial correlation?
17. Three unbiased coins are tossed. What is the probability of obtaining?  
 (a) all heads                      (b) two heads                      (c) at least one head  
 (d) at least two heads              (e) at most one head
18. Prove or disprove that mutual independence implies pairwise independence.
19. A discrete random variable  $X$  has the following probability functions.

X	0	1	2	3	4	5	6	7	8
f(x)	a	3a	5a	7a	9a	11a	13a	15a	17a

Find:

- (a) The value of a.                      (b)  $P(X < 3)$

**(Ceiling: 30 Marks)**

**Part C (Essay questions)**

Answer any *one* question. The question carries 10 marks.

20.

Student(Roll No.)	1	2	3	4	5	6	7	8	9	10
Marks in Maths	78	36	98	25	75	82	90	62	65	69
Marks in Statistics	84	51	91	60	68	62	86	58	53	47

Calculate the rank correlation coefficient.

21. The two regression lines are given by:

$$2x + 3y - 6 = 0$$

$$5x + 7y - 12 = 0$$

- (a) Identify the equation of Y on X and X on Y.  
 (b) Find the mean values of X and Y.

**(1 × 10 = 10 Marks)**

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