

D 124491**(Pages : 2)****Name.....****Reg. No.....****SECOND SEMESTER (CBCSS-UG) DEGREE SUPPLEMENTARY
EXAMINATION, APRIL 2025****Statistics****STA 2C 02—REGRESSION ANALYSIS AND PROBABILITY THEORY****(2019 Syllabus)****Time : Two Hours****Maximum Marks : 60****Section A***Each question carries 2 marks.**Maximum marks that can be scored from this section is 20.*

1. Define negative correlation.
2. Mention any two merits of scatter diagram.
3. Define Karl Pearson correlation coefficient.
4. How is correlation coefficient related with regression coefficients.
5. Why there are two regression lines ?
6. What is the use of regression analysis.
7. Define multiple correlation.
8. State multiplication theorem of probability for two events.
9. State classical definition of probability.
10. State addition theorem of probability for three events.
11. Define distribution function.
12. Define sample space of a random experiment with an example.

Section B*Each question carries 5 marks.**Maximum marks that can be scored from this section is 30.*

13. Explain the importance of correlation analysis in Economics.
14. If A, B, C are pairwise independent and A is independent of $B \cup C$, show that A, B, C are mutually independent.
15. Identify the regression lines from the equations $x + 2y - 5 = 0$ and $2x + 3y - 8 = 0$.

Turn over

16. Distinguish between Discrete and Continuous random variables with an example each.

17. Find Spearman rank correlation coefficient :

Candidate	1	2	3	4	5	6	7	8	9	10
Rank by Judge 1	1	6	5	10	3	2	4	9	7	8
Rank by Judge 2	3	5	8	4	7	10	2	1	6	9

18. The regression lines are $8x - 10y + 66 = 0$ and $40x - 18y - 214 = 0$. Find the mean values of x and y .

19. What are the limitations of frequency definition of probability ?

Section C

*Answer any **one** question.*

The question carries 10 marks.

Maximum marks that can be scored from this section is 10.

20. From the following data, find x on y regression equation :

x	3	5	6	7	10	11
y	8	12	11	14	16	17

21. Consider the pmf of X

x	0	1	2
$f(x)$	k	$2k$	$3k$

(i) Find k ; (ii) Sketch the pmf graphically ; (iii) Find $P(1 \leq X < 2)$ and $P(1/2 \leq X \leq 5/2)$.

(1 × 10 = 10 marks)