

SECOND SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2024
(Regular/Improvement/Supplementary)

PSYCHOLOGY
GPSY2C04T: REGRESSION ANALYSIS AND PROBABILITY THEORY

Time: 2 Hours

Maximum Marks: 60

SECTION A: Answer the following questions. Each carries two marks.

(Ceiling 20 Marks)

1. Define random variable.
2. What do you mean by mutually exclusive events?
3. Define correlation.
4. If $A = \{k, q, p, r, s\}$ and $B = \{m, n, p, r, l\}$, find $A \cup B$ and $A \cap B$.
5. Define random experiment.
6. What do you mean by linear correlation?
7. Define continuous random variable with a suitable example.
8. Write down any two properties of regression coefficients.
9. Define Probability mass function.
10. State the addition theorem of probability for any two events.
11. Write down Spearman's formula for rank correlation coefficient.
12. Define multiple regression.

SECTION B: Answer the following questions. Each carries five marks.

(Ceiling 30 Marks)

13. Compute correlation coefficient from the following data.

Anxiety	39	25	15	12	34	39	22	27
No. Details Recalled	3	7	5	2	4	3	6	7

14. Probability that a man will be alive 25 years hence is 0.3 and the probability that his wife will be alive 25 years hence is 0.4. Find the probability that 25 years hence.
- i) Both will be alive.
 - ii) Only the man will be alive.
 - iii) Exactly one of them is alive.
 - iv) At least one of them is alive.

(PTO)

15. A discrete random variable has the probability function:

x	0	1	2	3	4	5	6	7	8
p(x)	k	2k	3k	5k	5k	4k	3k	2k	k

- (a) Find k
 (b) Evaluate $P(X \geq 6)$
 (c) Evaluate $P(X < 3)$
 (d) Evaluate $P(0 < X < 6)$
16. Distinguish between partial and multiple correlation. What are the limitations of partial correlation?
17. Define distribution function. What are the properties of a distribution function?
18. Illustrate the use of scatter diagram.
19. From a group of 3 Indians, 4 Africans and 5 Americans a sub-committee of four people is selected by lots. Find the probability that the sub-committee will consist of
 (i) 2 Indians and 2 Africans,
 (ii) 1 Indian, 1 Africans and 2 Americans
 (iii) 4 Americans

SECTION C: Answer any one question. Each carries ten marks.

20. A Psychology Professor has devised a diagnostic quiz, which, when given during the first class, can accurately predict a student's performance on the final exam. So far data are available for 10 students, as follows:

Quiz score	5	8	3	1	10	6	7	4	2	6
Final exam score	82	80	75	60	92	85	86	70	42	78

- a) Find the regression equation for predicting the final exam score from the quiz.
 b) What final exam score would be predicted for a student who scored a 9 on the quiz?
21. If $r_{12} = 0.80$, $r_{13} = -0.40$ and $r_{23} = -0.56$, find the values of:
 a) $r_{12.3}$, $r_{23.1}$ and $r_{13.2}$
 b) $R_{1.23}$, $R_{2.13}$ and $R_{3.12}$

(1 × 10 = 10 Marks)