

QP CODE: D2BST2504	(Pages: 2)	Reg. No :
		Name :
SECOND SEMESTER FYUGP EXAMINATION, APRIL 2026 (Regular/Improvement/Supplementary) Discipline Specific Core (DSC) Courses - Minor 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. Does $r = 0$ mean there is absolutely no relationship? Explain.	BL1	CO1
2. Distinguish between Pearson's correlation and Rank correlation.	BL2	CO1
3. Give the equation for regression lines of y on x and x on y.	BL1	CO2
4. Give the expression for regression coefficients.	BL1	CO1
5. What is meant by conditional probability? Give the expression for the conditional probability of A given B.	BL2	CO3
6. Define random experiment.	BL2	CO3
7. A die is rolled, find the probability of getting an even face.	BL2	CO3
8. If A and B are two mutually exclusive events and $P(A) = 0.45$ and $P(B) = 0.35$, find $P(A \text{ or } B)$.	BL2	CO3
9. Define probability mass function.	BL2	CO4
10. What is meant by distribution function of a random variable?	BL3	CO4
Section B		
Answer the following questions. Each carries 6 marks (Ceiling: 36 Marks)		
11. Calculate the coefficient of correlation between the heights of fathers and sons (given in inches) from the following table: Height of father: 65 66 67 68 69 70 71 Height of son: 67 68 66 69 72 72 69	BL3	CO1
12. Define a scatter diagram. Explain its uses.	BL2	CO1
(PTO)		

13.	Explain the property that both regression coefficients cannot be greater than one.	BL2	CO2												
14.	The heights (in cm) and weights (in kg) of 5 children are: <table border="1"><tr><td>X</td><td>120</td><td>130</td><td>125</td><td>135</td><td>128</td></tr><tr><td>Y</td><td>25</td><td>28</td><td>26</td><td>30</td><td>27</td></tr></table> Find regression coeffecients and correlation coefficient.	X	120	130	125	135	128	Y	25	28	26	30	27	BL2	CO2
X	120	130	125	135	128										
Y	25	28	26	30	27										
15.	State addition rule of probability of two events. Deduce the result for mutually exclusive and independent events.	BL2	CO2												
16.	The marks of 100 students in an exam are distributed as follows: <table border="1"><tr><td>Marks</td><td>0–20</td><td>20–40</td><td>40–60</td><td>60–80</td><td>80–100</td></tr><tr><td>No. of Students</td><td>5</td><td>15</td><td>40</td><td>30</td><td>10</td></tr></table> Find the probability that a randomly selected student: (a) Scored less than 40. (b) Scored more than 60. (c) Scored between 40 and 80.	Marks	0–20	20–40	40–60	60–80	80–100	No. of Students	5	15	40	30	10	BL2	CO3
Marks	0–20	20–40	40–60	60–80	80–100										
No. of Students	5	15	40	30	10										
17.	Suppose that the probability of a woman entering a shop buys rice is 0.90 and the probability that she buys sugar is 0.70. Assuming that she is free to choose the items for puchase, what is the probability that she will buy both sugar and rice ?	BL3	CO3												
18.	What is a continuous random variable. Give two examples.	BL2	CO4												
Section C															
Answer any one question. Each carries 10 marks (1 x 10 = 10 Marks)															
19.	Calculate the coefficient of ranks from the following data. (X,Y): (5, 8), (10, 3), (6, 2), (3, 9), (19, 12), (5, 3), (6, 17), (12, 18), (8, 22), (2, 12), (10, 17), (19, 20).	BL3	CO1												
20.	Find k if $f(x) = k(x + x^2)$, $0 < x < 1$ is a probability distribution.	BL3	CO4												
CO : Course Outcome															
BL : Bloom's Taxonomy Levels (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)															