Reg No:..... K25FY2478 C
Name :.....

Second Semester FYUGP Statistics Examination APRIL 2025 (2024 Admission onwards) KU2DSCSTA132 (PROBABILITY THEORY AND BIVARIATE DATA ANALYSIS)

(DATE OF EXAM: 2-5-2025)

Time : 120 min Maximum Marks : 70

Part A (Answer any 6 questions. Each carries 3 marks)

1. If A is any event in the sample space S, show that $P(A^c) = 1 - P(A)$. 3

2. If $P(A) = 4/5$, $P(B) = 3/5$, find $P(A \cap B)$ if A and B are independent. 3

3. In an examination 30%, 25%,10% students failed in Statistics, English and both exams respectively. Find the probability that a randomly selected student failed in Statistics, if it is known that he failed in English . 3

4. Distinguish between discrete and continuous random variable. 3

5. If $p(x) = \frac{x}{15}$, where $x = 1, 2, 3, 4, 5$. Find $P(X = 1 \text{ or } 2)$. 3

6. What is scatter diagram? 3

7. State the properties of regression coefficient. 3

8. Distinguish between correlation and regression 3

Part B (Answer any 4 questions. Each carries 6 marks)

9. A box contains 6 red, 4 white and 5 black balls. A person draws 4 balls from the box at random. Find the probability that among the balls drawn there is at least one ball of each colour. 6

10. A four number is formed of the numbers 0, 7, 2, 5 without repetitions. Find the chance that the number formed is odd. 6

11. State and prove Bayes theorem. 6

12. A computer while calculating the correlation coefficient between two variables X and Y obtained the following.
$n = 30$, $\sum x = 120$, $\sum x^2 = 600$, $\sum y = 90$, $\sum y^2 = 250$, $\sum xy = 356$.
It was however, later discovered at the time of checking that it had copied down two pairs of observation (8, 10) and (12, 7) while the correct values are (8, 12) and (10, 9). Obtain the corrected value of the correlation coefficient between X and Y. 6

13. The following are the ranks given by two judges for 10 competitors in a recitation competition. Are they like the same type of recitation? 6

Judge I	5	4	2	6	7	10	9	1	8	3
Judge II	4	1	5	7	8	9	10	6	3	2

14. For 17 observations on x and y, the following data were obtained.
$\sum x = 544$, $\sum x^2 = 19040$, $\sum y = 244$, $\sum y^2 = 3773$, $\sum xy = 8413$.
Obtain the equations of the two regression lines. 6

Part C (Answer any 2 question(s). Each carries 14 marks)

15. If X is normal variate with mean 30 and S.D 5, find
(i) $P(26 < X < 40)$ (ii) $P(X > 45)$ (iii) $P(X < 25)$ (iv) $P(X > 35)$. 14

16. If the mean and variance of a binomial distribution are 4 and 2 respectively. Find the probability of getting
(i) exactly 2 successes (ii) less than 2 successes (iii) more than 2 successes (iv) at least 2 successes. 14

17. Find k, $P(12 \leq X \leq 20)$ and $P(X > 16)$, if following is the probability mass function of X.

X	8	12	16	20	24
$p(x)$	1/8	1/6	$k/6$	1/4	1/12

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