K23U 3453

Reg. No. : ....

Name : ....

III Semester B.Sc. Degree (C.B.C.S.S. – O.B.E. – Regular/Supplementary/ Improvement) Examination, November 2023
(2019 to 2022 Admissions)
COMPLEMENTARY ELECTIVE COURSE IN STATISTICS FOR B.Sc. GEOGRAPHY/PSYCHOLOGY
3C03STA (G&P) : Probability and Distribution Theory

Time : 3 Hours

Max. Marks : 40

PART – A
(Short Answer)

Answer all 6 questions. (6×1=6)

1. Define Pairwise Independence for 3 events A, B and C.

2. State axiomatic definition of probability.

3. Define random variable.

4. Write the probability density function of exponential distribution with mean 0.5.

5. State addition theorem.

6. Define discrete random variable.

PART – B
(Short Essay)

Answer any 6 questions. (6×2=12)

7. Two dice are rolled. If the two faces are different, what is the probability that at least one is a six ?

8. Give two practical applications of Bayes theorem.

9. Define probability mass function.

10. Write the mean of $F_{(m, n)}$ - distribution. What is the condition for the existence for the mean ?

P.T.O.

11. Give two applications of Chi-square distribution.

12. Define a statistic. Give one example.

13. State the multiplication theorem .

14. Show that the mean of binomial distribution is always greater than its variance.

PART – C

(Essay)

Answer **any 4** questions. (4×3=12)

15. A speaks truth 4 out of 5 times. A die is rolled. He reports that there is a six. What is the chance that actually there was six ?

16. Write the probability density function, mean and variance of normal distribution.

17. Write Poisson distribution as a limiting case of binomial distribution.

18. Comment on the following :

    The mean of a binomial distribution is 3 and variance is 4.

19. Give the relation between t-distribution and F-distribution.

20. If the events S and T have equal probability and are independent with $P(S \cap T) = p > 0$, then find the value of $P(S)$.

PART – D

(Long Essay)

Answer **any 2** questions. (2×5=10)

21. With the usual notations, find p for binomial variate X, if n = 6 and $9\,P(X = 4) = P(X = 2)$.

22. What are the properties of distribution function ?

23. X is normally distributed and the mean of X is 12 and standard deviation is 4. Find $P(0 \le X \le 12)$.

24. Let the random variable X have the distribution :

    $P(X = 0) = P(X = 2) = p$; $P(X = 1) = 1 - 2p$, for $0 \le p \le \dfrac{1}{2}$. For what values of p is the Var(X) a maximum ? Give the maximum value of Var(X).