B.Sc. DEGREE EXAMINATION,NOVEMBER 2018
II Year III Semester
Allied-Paper
MATHEMATICAL STATISTICS-I

Time : 3 Hours **Max.marks :60**

Section A $(10 \times 1 = 10)$ Marks

Answer any **TEN** questions

1. Define trial.
2. Define equally likely events.
3. Define discrete random variable?
4. Write the properties of distribution.
5. State Addition theorem on expectation.
6. Define rthmoment about the origin.
7. Write any one examplesof Bernoulli trials.
8. Write the mean and variance of normal distribution .
9. Write the MGF of gamma distribution.
10. Write the definition of beta distribution of first kind.
11. Define independent events.
12. Define poisson distribution.

Section B $(5 \times 4 = 20)$ Marks

Answer any **FIVE** questions

13. A coin is tossed twice. Find the probability of getting atleast one head.
14. Explain cumulative probability distribution function.
15. Find the mathematical expectation of the product of the points on n dice.
16. Find the rth moment about the origin, the mean and the standard deviation of the distribution whose p.d.f is given by
$$f(x) = \begin{cases} 2(1-x) \quad for \quad 0 < x < 1 \\ 0, otherwise \end{cases}$$
17. Derive the mean of gamma distribution.
18. An integer is chosen at random out of the integers from 1 to 100. What is the probability that it is (i) multiple of 5 and (ii) divisible by 7.
19. Write the properties of normal distribution.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. A company has three machines M_1, M_2, M_3 which produces 20%, 30% and 50% of the products respectively. Their respective defective percentages are 7, 3 and 5. From these products one is chosen and inspected. It is defective. What is the probability that is has been made by machine M_3.

21. A continuous random variable x has the following pdf

    $$f(x) = \begin{cases} 3x^2 \quad for \quad 0 < x < 1 \\ 0, otherwise \end{cases}$$

    Verify that it is a pdf and evaluate the following probabilities.

    (i)$P\left(X \leq \frac{1}{3}\right)$, (ii)$P\left(\frac{1}{3} \leq X \leq \frac{1}{2}\right)$

22. If X and Y are independent random variables defined on a sample space S then E(XY) = E(X)E(Y)

23. Derive the recurrence formula for the moments of Binomial distribution.

24. Derive the mean and variance of Uniform distribution.

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