SRI VENKATESWARA UNIVERSITY
B.A. DEGREE COURSE IN STATISTICS (NON MATHS)
III - SEMESTER
(Under CBCS W.E.F. 2021-22)

PAPER - III :STATISTICAL METHODS AND PROBABILITY

Course Outcomes:

After successful completion of this course, the student will be able to;
1) Knowledge related to concept of attributes.
2) knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes.
3) knowledge to conceptualize the probabilities of events including frequentand axiomatic approach. Simultaneously, they will learn the notion of conditional probability.
4) knowledge related to concept of discrete and continuous random variables and their probability distributions including expectation and moments,
5) knowledge related to concept of random variable, Probability mass function and probability density function.
6) knowledge related to concept of Mathematical expectation.

COURSE SYLLABUS:

UNIT-I

Attributes: Classes, 2x2, manifold classification, class frequencies, ultimate classes frequencies, contingency tables, association and independence of attributes, consistency of data, coefficient of colligation.

UNIT -II

Moments: Central and Non - Central moments, Sheppard's correction for moments for grouped data. Skewness, kurtosis, and their measures.

UNIT-III

Concept on Permutations and Combinations.

Probability: Definitions of random experiment, outcome, sample space, event, mutually exclusive event, equally likely events, favorable events, classical, statistical and axiomatic definitions of probability. Addition and multiplication theorems for two events. Conditional probability.

UNIT-IV

Random variable : Discrete - Probability mass function. Continuous Random Variable - Probability density function, distribution function of a R.V and properties.

UNIT-V

Mathematical expectation: Basic results& properties of M.G.F, C.G.F, C.F

Note :1. Concentration on numerical problems Only.
   2. Proofs of theorems and Derivations of expressions are omitted.

Text Book:

   1.Statistical Methods by S.P.Gupta.

   1. Fundamentals of Mathematical statistics - S.C. Gupta &V.K.Kapoor.

Reference books:

   1. Sambavyatha - TeluguAcademy.

   2. Fundamentals of statistics - Goon, Gupta and Das Gupta.

Paper-3: Practicals:

   1.Non central Moments
   2.Central Moments
   3.Sheppard'scorrections,
   4.skewness
   5.Kurtosis.
    6.Coefficients of Association andcolligation
    7..Attributes
    8.Probability
    9.Random variable
   10.Mathematical Expectation

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SRI VENKATESWARA UNIVERSITY

B.A STATISTICS

(NON-MATHEMATICS COMBINATION)

III – SEMESTER
MODEL QUESTION PAPER

(Under CBCS W.E.F. 2021-22)

STATISTICAL METHODS AND PROBABILITY

(Statistical tables and Electronic Calculators are allowed)

TIME: 3 HOURS   **MAX.MARKS:75**

SECTION-A

ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 5 MARKS 5X5=25

1. Explain independent of Attributes.

2. Define Coefficient of Colligation.

3. The first four non central moments of a distribution are -1.5,17,-30 and 108.Find Moments

4. Write Sheppard correction for moments.

5. Define random experiment and sample space.

6. In a single throw with two dice find the probability of throwing a sum $(i) 10 \; (ii)$ which is a perfect square.

7. Define Random variable.

8. A random variable X has the following probability function

$X = x$	-2	-1	0	1	2	3
$P(X = x)$	0.1	K	0.2	2k	0.3	K

9. Define Mathematical Expectation.

10. Write the additive property of M.G.F

ANSWER ANY FIVE QUESTIONS.EACH QUESTION CARRIES 10 MARKS 5X10=50

11. Given the following ultimate class frequencies , find the frequencies of positive class.

$$(ABC) = 149 \ (AB\gamma) = 738 \ (A\beta C) = 225 \ (A\beta\gamma) = 1196$$
$$(\alpha BC) = 204 \ (\alpha B\gamma) = 1762 \ (\alpha\beta C) = 171 \ (\alpha\beta\gamma) = 21842$$

12. Find if A and B are independent , positively associated or negatively associated in each of the following data.

$$(i) N = 1000, (A) = 470, (B) = 620, (AB) = 320$$
$$(ii)(A) = 490, (AB) = 294 (\alpha) = 570 (\alpha B) = 380$$
$$(iii)(AB) = 256, (\alpha B) = 768, (A\beta) = 48, (\alpha\beta) = 144$$

13. Calculate the first four central moments of the following distribution about mean and hence find $\beta_1 \ and \ \beta_2$

x	0	1	2	3	4	5	6	7	8
f	1	8	28	56	70	56	28	8	1

14. For a distribution the mean is 10,variance is 16, γ_1 is 1 and β_2 is 4. Obtain the first four moments about the origin.

15. If $P(A) = \dfrac{1}{3}, P(B) = \dfrac{1}{4}, P(AUB) = \dfrac{23}{60}$ then find $P\left(\dfrac{A}{B}\right), P\left(\dfrac{B}{A}\right)$

16. Define conditional probability. State multiplication theorem for two events.

17. Explain properties of distribution function.

18. A random variable X has the following probability function.

$X = x$	0	1	2	3	4	5	6	7
$P(X = x)$	0	K	$2K$	$2K$	$3K$	K^2	$2K^2$	$7K^2 + K$

Find $(i) K \ (ii)$ Mean (iii) Variance

19. Find expected number of heads in tossing three coins.

20. Write the properties of C.G.F