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SUBJECT CODE NO:- 2114
FACULTY OF SCIENCE AND TECHNOLOGY
B.Sc. T.Y Sem. V
Examination March/April-2022 (To Be Held In June/July-2022)
Mathematics MAT-503 OR
1) Mathematical Statistics – I

[Time: 1:53 Hours]

[Max.Marks:50]

Please check whether you have got the right question paper.

N.B.

- i) All questions are Compulsory.
- ii) Figures to the right indicate full marks.

Q.1 (A) Attempt any one :

- (a) State and Prove the formula for mode in case of continuous frequency distribution. 08
- (b) Explain Histogram with Suitable example. 08

(B) Attempt any one :

- (c) Find the mean and variance of the first 20 natural numbers. 07
- (d) Find the median of the following frequency distribution : 07

Class intervals	0-10	10-20	20-30	30-40	40-50
Frequency	14	25	27	24	15

Q.2 (A) Attempt any one :

- (a) Find the relation between root mean square deviation and standard deviation. 08
- (b) Define moments. 08

Establish the relationship between moments about mean and the moments about any point.

(B) Attempt any one :

- (c) Calculate the standard deviation of the set of numbers 3, 4, 9, 11, 13, 6, 8, 10. 07
- (d) Probability that a boy will pass an examination is $\frac{3}{5}$ and that for a girl is $\frac{2}{5}$. What is the Probability that at least one of them passes examination? 07

Q.3 (A) Attempt any one :

- (a) Define : 05
 - (i) Range
 - (ii) Quartile deviation
 - (iii) Mean deviation
 - (iv) Standard deviation
 - (v) Coefficient of Variation.
- (b) Prove that, if A and B are independent events then \bar{A} and \bar{B} are also independent events. 05

(B) Attempt any one :

- (c) A distribution consists of three components with frequencies 200, 250, 300 having means 05

of 25, 10 and 15 respectively.
Find the mean of the Combined distribution.

(d) For two Observations, x_1, x_2 ,

Prove that : $A \cdot H = G^2$,

Where A = Arithmetic Mean,

H = Harmonic Mean,

G = Geometric mean.

05

Q.4 Choose the Correct alternative of the following :

10

(i) The Probability that a Card drawn at random from the pack of Playing Cards may be either a queen or an ace card is _____.

(a) $\frac{1}{13}$

(b) $\frac{13}{2}$

(c) $\frac{3}{13}$

(d) $\frac{4}{13}$.

(ii) The algebraic sum of the deviations of all the Variate Values from their arithmetic mean is _____.

(a) 1

(b) 2

(c) 0

(d) Minimum.

(iii) The variance of the six numbers 4, 4, 5, 5, 6, 6 is _____.

(a) 0

(b) $\frac{1}{3}$

(c) $\frac{3}{5}$

(d) $\frac{2}{3}$.

(iv) Which of the following is a Continuous Variable :

(a) The number of Workers in a firm.

(b) Weight.

(c) The number of students in a class.

(d) The number of childrens in a family.

(v) The Square of Standard deviation is known as _____.

(a) Variance

(b) Mean deviation

(c) Moments

(d) Root Mean Square Deviation.