B.Sc. DEGREE EXAMINATION, APRIL 2018.

II YEAR III SEMESTER

Allied II-Paper I - MATHEMATICAL STATISTICS - I

Time : 3 Hours Max. Marks : 60

SECTION A – (10 × 1 = 10 marks)

(Q. No. 1-12)Answer any *TEN* questions

1. In an experiment a coin is thrown 5 times. How many points are there in the sample space.
2. Define an event.
3. Define a random variable.
4. Define distribution function.
5. Define expectation of a random variable.
6. Fine Var(2X+1) if V(X) = 1.
7. What is correlation?
8. Write the regression equation of Y on X.
9. What is mean and variance of binomial distribution.
10. Define Poisson distribution.
11. Write the mgf of normal distribution.
12. Give the formula for Spearman's rank correlation coefficient.

SECTION B – (5 × 4 = 20 marks)

(Q. No. 13-19)Answer any *FIVE* questions

1. State and prove addition theorem of probability.
2. Two dice are tossed. Find the probability of getting an even number on the first die or total of eight.
3. Mention the properties of distribution function.
4. If X and Y are random variables, Prove that E(X+Y) = E(X) + E(Y) provided all the expectations exist.
5. Let X be a random variable with the following distribution:

X : -3 6 9

P(X =x): 1/6 1/2 1/3 Evaluate E(2X+1)

1. Write the properties of regression coefficient.
2. Obtain the mgf of Binomial istribution.

SECTION C – (3 × 10 = 30 marks)

(Q. No. 20-24)Answer any *THREE* questions

1. State and prove Bayes theorem.
2. The joint density function of a two dimensional random variable (X,Y) is given by:

f(x,y) = 2, 0 < x <1, 0 < y < x

0 otherwise

(i) find the marginal distribution functions of X and Y. (ii) find the conditional density function of Y given X = x and conditional density of X given Y = y. (iii) Check the independence of X and Y

1. Establish Chebychev's inequality.
2. Distinguish between correlation and regression.
3. Obtain the mgf of Poisson distribution. Find its mean and variance.