

Faculty of Science

B.Sc. (Statistics) I Year, CBCS - I Semester Examination, July 2017

Paper-I (Descriptive Statistics and Probability)

Time: 3 h

Max Marks: 80

Section-A

I. Answer any **Five** of the following questions.

(5x4=20 Marks)

1. Define Skewness and show that Bowley's coefficient of Skewness lies between -1 and +1.
2. What is Dispersion? Explain the various measures of dispersion.
3. The probability that a student passes a physics test is $\frac{2}{3}$ and the probability that he passes the both Physics and English test is $\frac{14}{45}$. The probability that he passes at least one test is $\frac{4}{5}$. What is the probability that he passes the English test?
4. Define axiomatic definition of probability.
5. Define i) Discrete and continuous random variables ii) p.m.f and p.d.f of random variables with examples.
6. Discuss Independence of random variables.
7. State and prove multiplication theorem of expectation for two variables.
8. Define Raw and Central moments in terms of mathematical expectation.

Section-B

II. Answer all the following questions.

(4x15=60 Marks)

9. (a) What are primary and secondary data? Explain the sources of secondary data.

(OR)

- (b) Define the raw and central moments of a frequency distribution. Obtain the relationship between the central moment's in terms of raw moments.

10. (a) State and prove addition theorem of probability for 'n' events.

(OR)

- (b) State and prove Baye's theorem.

11. (a) Define Distribution function of a random variable and state and prove its properties.

(OR)

- (b) i) Define joint probability mass and joint density functions?

- ii) The joint p.d.f of two dimensional r.v (X,Y) is given by

$$f(X,Y) = \begin{cases} kx^2y, & 0 < x < 1; 0 < y < 1 \\ 0, & \text{otherwise} \end{cases}$$

Find the value of k and the marginal densities of X and Y.

12. (a) Define m.g.f and c.g.f and state and prove the properties of m.g.f.

(OR)

- (b) What is characteristic function? State and prove its properties.
