2012

B.A./B.Sc. (General) First Semester

Statistics

Paper – 101: Probability Theory and Descriptive Statistics - I

Time allowed: 3 Hours

Max. Marks: 65

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two question from each Unit.

x-x-x

1. Attempt all questions

   I.   Define Stem and leaf plot. (2)

   ii. What do you mean by population? (2)

   iii. How mean, mode and median are relate to each other. (1)

   Iv. What are the axioms of the Probability? (2)

   v.   What do you mean by Independent events? (2)

   vi. Define Kurtosis. (2)

   vii. Define pmf. (2)

UNIT-I

2. (i) What is the difference between additive and multiplicative law of probability. Also discuss the conditions for independent events. (8)

   (ii) A ball contains 30 balls numbered from 1 to 30. One ball is drawn at random. Find the probability that the number of ball is a multiple of 5 or 8. (5)

3. (i) Explain the concept of conditional probability. (6)

   (ii) The probabilities of X, Y and Z becoming managers are 4/9, 2/9 and 1/9 respectively. The probability that the Bonus scheme will be introduced if X, Y and Z becomes managers are 3/10, 1/2 and 4/5 respectively. What is the probability that Bonus Scheme will be introduced? (7)

4. (i) Differentiate between pmf and pdf. Two cards are drawn one by one without replacement from a well shuffled pack of 52 cards. Find the probability distribution of the number of aces. (7)

   (ii) A die is tossed twice. Getting a number greater than 4 is considered a success. Find the variance of the probability distribution of the number of success. (6)

5. (i) Define moment generating function and its properties. (5)

   (ii) The joint probability distribution of two random variables X and Y is given by

   $P(X = 0, Y = 1) = \frac{1}{3}, (X = 1, Y = -1) = \frac{1}{3}$, and $P(X = 1, Y = 1) = \frac{1}{3}$

   Find (a) marginal distribution of X and Y

   (b) conditional distribution of X given Y = 1. (8)

P.T.O.

UNIT – II

6. (i)Distinguish between classification and tabulation of statistical data. Mention the requisites of a good statistical table. (6)

(ii)Define Primary data. Explain the methods of collecting primary data. (7)

7. (i)What is the importance of ogives? How do you construct an ogive curve. (6)

(ii) To represent the information on number of patients suffering from seven diseases in a hospital over two years, which graph is suitable and discuss why? (7)

8. (i) Define measure of dispersion. Explain any two measure of dispersion in detail. (8)

(ii) The following data are the oxygen uptakes (in milliliters) during incubation of a random sample of 10 cell suspensions:

14.0 14.1   14.5   13.2   11.2   14.0   14.1   12.2   11.1   13.7   (5)

Compute Standard deviation

9. (i)Define mean and median of a frequency distribution. Compare and contrast them as a measure of central tendency. Give examples to illustrate your statements. (8)

(ii) Listed below are the results of a first time in humans' clinical trial of a new agent with 90 mg/tablet administered to 30 healthy male volunteers.

42   45   40   38   35   47   40   27   39   43   40   53   23   51   42   48   40

36   51   40   48   34   21   40   31   34   39   41   36

Calculate the (a)   Mean   (b)   Median (5)

x-x-x