AS–1357

B.Sc. (Part-I) Semester—I Examination

STATISTICS

Time : Three Hours] [Maximum Marks :80

Note. :—ALL questions are compulsory.

1. (A) Fill in the blanks :

(i) The n^{th} root of the product of n observations is called _____.

(ii) Square of standard deviation is _____.

(iii) Probability of an event is always _____.

(iv) Height of a person is a _____ variable. 2

(B) Choose the correct alternative (MCQ) :

(i) The sum of squares of the deviations of a set of values is minimum when it is taken about :

(a) Median (b) Mode (c) Mean (d) S.D.

(ii) Which partition value divided total observations into two equal parts ?

(a) Quartiles (b) Deciles (c) Percentiles (d) Median

(iii) A coin is tossed three times in succession, the number of sample points in sample space is :

(a) 3 (b) 6 (c) 8 (d) 9

(iv) If P(A) = 0 then event A is called :

(a) Probable event (b) Sure event

(c) Impossible event (d) None of these 2

(C) Answer in one sentence : 4

(i) State formula for coefficient of variation.

(ii) Give relationship between A.M., G.M. and H.M.

(iii) Define sample space.

(iv) What are the limits of probability of an event ?

2. (A) What are the limitations of Statistics ? 4

(B) Stating merits clearly, explain direct personal investigation method for collecting primary data. 4

(C) Define : (i) Nominal scale (ii) Ordinal scale 4

OR

3. (P) Discuss scope of Statistics in agricultural sciences and medical sciences. 4

(Q) State the function of NSSO. 4

(R) Define with example :

(i) Discrete data (ii) Continuous data 4

4. (A) Explain tabulation of data. State its various types. 4

(B) Prove that the sum of deviations of various values from their respective mean is zero. 4

(C) Define : (i) Partition values (ii) Deciles 4

OR

5. (P) Explain median for a frequency distribution. Also state its merits. 4

(Q) Discuss the concept of central tendency. Give its various measures. 4

(R) What are the basic principles of a good classification ? 4

6. (A) Define variance of a r.v.x. Prove that variance is independent at change of origin but not of scale. 6

(B) Explain raw moments and central moments. Establish relationship between them. 6

OR

7. (P) Define terms Kurtosis and Skewness. State various measures of skewness. 6

(Q) Explain the term 'Dispersion'. State its various measures. What are the characteristics of ideal measures of dispersion ? 6

8. (A) Define : (i) Favourable events (ii) Exhaustive events 4

(B) Discuss conditional probability. State multiplication rule of probability for two events. 4

(C) Two cards are drawn at random from a pack of cards. What is the probability that the cards drawn contains both aces ? 4

OR

9. (P) What do you mean by 'Statistical probability' ? 4

(Q) State and prove addition theorm of probability for two events A and B. 4

(R) Describe sample space when two dice are thrown. Find probability that sum of points on upper face is 12. 4

10. (A) Define continuous r.v. and its probability function. 4

(B) Explain distribution function of a r.v.x. State its various properties. 4

(C) Obtain probability distribution of number of heads when two coins are tossed. Also find its mean. 4

OR

11. (P) For a r.v.x. and C is some constant then show that $v(cX) = c^2.v(X)$ 4

(Q) A r.v.x. has following probability distribution :

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 the constant k. 4

(R) Explain expectation of a linear combination of random variables. 4

12. (A) Define : (i) M.G.F. (ii) C.G.F.

Discuss effect of change of origin and scale on m.g.f. 6

(B) Define : (i) Joint p.d.f. (ii) Marginal p.d.f. 6

Following Table represents the joint probability distribution of X and Y in which k is unknown constant. Find the value of k.

Y \ X	1	2	3
1	k	2k	3k
2	2k	4k	6k
3	3k	6k	9k

OR

13. (P) Define : (i) P.G.F. (ii) M.G.F.

State and prove additive property of m.g.f. for n independent random variables. 6

(Q) Discuss conditional p.d.f. of X given Y and Y given X.

$f(x,y) = 4xy,\ 0<x<1,\ 0<y<1$

$= 0$ o.w.

Test the independence of X and Y. 6