

B.Sc. (Part-I) Semester-I Examination

IS : STATISTICS

Time : Three Hours]

[Maximum Marks : 80

Note :— All questions are compulsory.

1. (A) Fill in the blanks :
- (i) Deciles divide the series into _____ equal parts.
 - (ii) Probability lies between _____.
 - (iii) The mathematical expectation of product of _____ random variables is the product of their expectation.
 - (iv) The most stable measure of dispersion is _____. 2
- (B) Choose the correct alternative (MCQ) :
- (i) The ideal measure of central tendency is :
 - (a) Arithmetic mean (b) Harmonic mean
 - (c) Geometric mean (d) Mode
 - (ii) The highest level of scale of measurement is :
 - (a) Ordinal scale (b) Nominal scale
 - (c) Ratio scale (d) Interval scale
 - (iii) If $P(A) = 0$ then event A is called :
 - (a) Probable event (b) Sine event
 - (c) Impossible event (d) None of these
 - (iv) Standard deviation depends upon :
 - (a) Origin (b) Scale
 - (c) Origin and Scale (d) None of these 2
- (C) Answer in **one** sentence each :
- (i) What do you mean by nominal data ?
 - (ii) Define random variable.
 - (iii) What is median ?
 - (iv) Define raw moment. 4
2. (A) Explain primary data and secondary data. 4
- (B) Explain the function of NSSO. 4
- (C) Define : 4
- (i) Ratio scale
 - (ii) Interval scale.
- OR**
3. (P) What are the importance of statistics ? 4
- (Q) What are the functions of CSO ? 4
- (R) What are the limitations of statistics ? 4
4. (A) Show that algebraic sum of deviations of various values taken from arithmetic mean is zero. 4
- (B) How will you obtain median in case of continuous frequency distribution ? 4
- (C) Explain classification of data. State its various types. 4

OR

5. (P) What are the basic principles of a good classification 4
 (Q) Define arithmetic mean. State its merits and demerits. 4
 (R) Define the term: less than and more than cumulative frequency distribution. 4
6. (A) Obtain the relation between standard deviation & root mean square deviation. 4
 (B) State the characteristics of an ideal measure of dispersion. 4
 (C) Obtain the relationship between central moments and raw moment. 4

OR

7. (P) Show that standard deviation is least value of root mean square deviation. 4
 (Q) Define Range and Coefficient of Range. 4
 (R) Show that variance is independent of change of origin but not of scale. 4
8. (A) State axioms of probability. 4
 (B) Define :
 (i) Favourable Event. 4
 (ii) Random Experiment. 4
 (C) A card is drawn from a well shuffled pack of playing cards. What is the probability that it is either a spade or an ace ? 4

OR

9. (P) What is the chance that non-leap year selected at random will contain 53 Sundays ? 4
 (Q) Prove that : $P(A \cup B) = P(A) + P(B) - P(A \cap B)$
 where A and B are any two events. 4
 (R) Define axiomatic approach of the probability. 4
10. (A) Define distribution function of a random variable X and prove that :
 $P(a < x \leq b) = F(b) - F(a)$ 6
 (B) Define variance of random variable in terms of mathematical expectations. Show that :
 $V(ax + b) = a^2V(x)$ 6

OR

11. (P) If F is distribution of r. v. x then,
 $F(-\infty) = \lim_{x \rightarrow -\infty} F(x) = 0$
 $F(\infty) = \lim_{x \rightarrow \infty} F(x) = 1$ 6
 (Q) Prove that :
 (i) $E(ax + b) = a E(x) + b$
 (ii) $E(ax) = a E(x)$
 (iii) $V(ax + b) = a^2V(x)$ 6
12. (A) Let X be the r.v. with p.d.f.

X :	0	1	2	3
P(x) :	1/3	1/2	1/24	1/8

 Find $E(x)$, $E(x^2)$ and $V(x)$ 6
 (B) Define moment generating function. Find its effect of change of origin and scale. 6

OR

13. (P) State and prove addition property of m.g.f. Prove that $M_{cx}(t) = M_x(ct)$ 6
 (Q) Explain joint probability mean function of marginal and conditional probability functions. 6