www.sgbauonline.com

First Semester B. Sc. (Part – I) Examination

1S : STATISTICS

P. Pages : 7

Time : Three Hours] [Max. Marks : 80

Note : All questions are compulsory.

1. (A) Fill in the blanks :—

(i) Probability Lies between —— .

(ii) The covariance of two independant random variables is —— .

(iii) The scale in which ordering is preferable is —— .

(iv) The data in which numerical value of variable is considered is —— . 2

(B) Choose the correct alternative (MCQ) :—

(i) The head office of CSO is at

(a) Bombay

(b) Madras

(c) Delhi

(d) Bangalore.

www.sgbauonline.com

www.sgbauonline.com

(ii) The probabil .y of sure event is

(a) 1

(b) 0

(c) – 1

(d) ∞.

(iii) IIPS stands for

(a) International Institution of Population Science

(b) International Institution of power studies

(c) International Institution of polar science

(d) None of the above.

(iv) Fot two independant random variables E (xy) = ——

(a) E (x) · E (y)

(b) E (x) / E (y)

(c) E (x) + E (y)

(d) E (x) – E (y). 2

(C) A swer in **one** sentence :—

(i) What do you mean by nominal data ?

(Q) Two discrete random variables X and Y have the joint probability density function :

$$P(x, y) = \frac{\lambda^x e^{-\lambda} P^y (1-P)^{x-y}}{y!(x-y)!}, y = 0, 1, 2, \ldots x ; x = 0, 1, 2, \ldots$$

where λ, P are constants with $\lambda > 0$ and $0 < p < 1$ find

(i) marginal probability density functions of X and Y.

(ii) The conditional distribution of Y for given X and of X for a given Y. 6

www.sgbauonline.com

www.sgbauonline.com

OR

11. (P) Define variance and co – variance of random variable. Also show that

$$V(aX + b) = a^2 V(X)$$

where X and Y are random variable and a , b are constant. 6

(q) A random variable X has the following probability function

Values of X, x :	– 2	– 1	0	1	2	3
P(x) :	0.1	K	0.2	2K	0.3	K

(i) Find the value of K

(ii) Calculate mean and variance. 6

12. (A) Define M. G. F. State and prove additive property of M. G. F. 6

(B) Let the random variable X assume the value 'r' with the probability law :

$$P(X = r) = q^{r-1} P , r = 1 , 2 , 3 , ...$$

Find the m. g. f. of X and hence find mean and variance. 6

OR

13. (P) State and prove additive property of cumulant. 6

(ii) Define percentile.

(iii) Define random experiment.

(iv) What is the probability of impossible event. 4

2. (A) What are the functions of CSO ? 4

(B) What do yu mean by Qualita data ? 4

(C) What are the limitations of Statistics ? 4

OR

3. (P) State the various definitions of Statistics. 4

(Q) Describe the scope of statistics in medical science. 4

(R) Explain the functions of NSSO. 4

4. (A) Explain the concept of central tendancy. 4

(B) Explain various types of classification. 4

(C) How will you obtain median in case of continuous frequency distribution ? 4

OR

5. (P) Show that sum of squares of deviations of various values taken from arithmetic mean is minimum. 4

www.sgbauonline.com

www.sgbauonline.com

(Q) Find the arithmetic mean of first n natural number. 4

(R) What are the partition values ? 4

6. (A) Define

(i) Range (ii) Coefficient of Range. 4

(B) State the merits and demerits of Q. D. 4

(C) Discuss the effect of change of Origin and Scale on moments. 4

OR

7. (P) State the various formulas for calculating standard deviation. 4

(Q) Define raw moments and central moments and obtain relationship between them. 4

(R) State and prove that for any discrete distribution S. D. is not less than MD from mean. 4

8. (A) Define

(i) Trial and Event

(ii) Exhaustive Event. 4

(B) What is the chance that non-leap year selected at random will contain 53 sundays ? 4

(C) State and prove addition theorem of probability for any two events A and B. 4

OR

9. (P) Define axiomatic approach of the probability. 4

(Q) A bag contains 3 red, 6 white and 7 blue balls. What is the probability that two balls drawn are white and blue ? 4

(R) Prove that,
$P(A \cup B) = P(A) + P(B) - P(A \cap B)$.
Where A and B are any two events. 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 p. m. f. given the probability function of a random variable X.

X :	1	2	3	4	5	6
P(X) :	1/6	1/6	1/6	1/6	1/6	1/6

Find its mean. 6

www.sgbauonline.com