2020/TDC (CBCS)/ODD/SEM/ STSHCC–101T/109

TDC (CBCS) Odd Semester Exam., 2020 held in March, 2021

STATISTICS

(1st Semester)

Course No. : STSHCC–101T

(Descriptive Statistics)

Full Marks : 50

Pass Marks : 20

Time : 3 hours

The figures in the margin indicate full marks for the questions

SECTION—A

1. Answer any *ten* of the following questions :

$2 \times 10 = 20$

(a) Explain the meaning of the word 'statistics'.

(b) Define statistical population and sample.

(c) Mention different types of scale of measurement.

　　　　　　　　　　(*Turn Over*)

(d) What is a statistical table?

(e) Consider the following observations from a population :

88, 235, 73, 138, 140, 171, 229, 153, 72

Calculate AM and median.

(f) Define mean deviation as a measure of dispersion.

(g) Define raw and central moments.

(h) Find the coefficient of variation of a frequency distribution given that its mean is 120, mode is 123 and Karl Pearson's coefficient of skewness is −0·3.

(i) Write down the properties of Karl Pearson's correlation coefficient.

(j) What is the relationship between correlation coefficient and regression coefficient?

(k) Why are there always two lines of regression?

(l) Explain scatter diagram.

(m) When are two attributes said to be independent?

(n) Find, if A and B are positively associated on the basis of the following data :

$N = 1000, (A) = 470, (B) = 620, (AB) = 320$

(o) What do you mean by consistency of data?

(p) Explain the principle of least squares.

(q) Give classical definition of probability and write about its limitations.

(r) Four cards are drawn at random from a pack of 52 cards. Find the probability that they are a king, a queen, a jack and an ace.

(s) What do you mean by independent events?

(t) State the theorem of total probability.

SECTION—B

Answer *any* **five** questions

2. (a) Define classification and tabulation. Mention essential parts of a good statistical table. 2+2=4
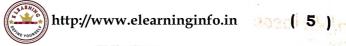
(b) Explain ordinal scale of measurement with an example. 2

3. (a) Distinguish between quantitative data and qualitative data. 2

(b) Describe different types of graphs that are used for representing a frequency distribution. 4

4. (a) Define standard deviation. Show that it is independent of change of origin but not of scale. 1+3=4

(b) The AM of two observations is 127·5 and GM is 60. Find their HM. 2

5. (a) Explain the methods of measuring skewness and kurtosis of a frequency distribution. 3

(b) Obtain the relation between central moment of order r in terms of raw moments. 3

6. (a) Define rank correlation. Derive the Spearman's formula for rank correlation coefficient. 1+3=4

(b) Out of two lines of regression given by

$$X + 2Y - 5 = 0 \text{ and } 2X + 3Y - 8 = 0$$

which one is regression line of X on Y? 2

7. (a) In a trivariate distribution

$$\sigma_1 = 2, \sigma_2 = \sigma_3 = 3, r_{12} = 0·7, r_{23} = r_{31} = 0·5$$

find (i) $r_{12·3}$ and (ii) $R_{1·23}$. 3

(b) Find the formula for multiple correlation coefficient in terms of total correlation coefficients for a trivariate distribution. 3

8. (a) Explain the method of fitting a straight line to a set of data by method of least squares. 4

(b) Define Yule's coefficient of collegation and coefficient of association. 2

9. (a) Establish the relationship between Yule's coefficient of association Q and coefficient of collegation Y. 3

(b) When are two attributes said to be positively associated and negatively associated? Also define complete association and complete dissociation between two attributes. 3

10. (a) Define the terms 'mutually exclusive events' and 'independent events'. Give examples. 2+1=3

(b) State and prove the law of multiplication of probability for any two events A and B. 3

11. *(a)* State and prove Bayes' theorem of probability. 3

(b) If A and B are two independent events and $P(A) = 0 \cdot 57$ and $P(B) = 0 \cdot 73$, then evaluate the probability of occurrence of at most one of the two events. 3

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