2019/TDC/ODD/SEM/STSGE/ STSDSC–101T/116

TDC (CBCS) Odd Semester Exam., 2019

STATISTICS

(1st Semester)

Course No. : STSGE/STSDSC–101T

(Descriptive Statistics and Probability Theory)

Full Marks : 50

Pass Marks : 20

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **all** questions

UNIT—I

1. Define any *three* of the following :   1×3=3

   (a) Sample

   (b) Qualitative data

   (c) Class limits

   (d) Nominal data

(Turn Over)

2. Answer any *one* of the following :   2

   (a) Discuss two limitations of statistics.

   (b) Define the meaning and objectives of statistics.

3. Answer any *one* of the following :

   (a) *(i)* Define tabulation and classification of data.

       (ii) Discuss the significance of diagrams in statistics.   (1½+1½)+2=5

   (b) *(i)* Draft a blank table to show the distribution of workers in a manufacturing concern according to the following :   3

         (1) Sex—males and females

         (2) Three grades of salary—below ₹ 5,000, ₹ 5,000–₹ 10,000, ₹ 10,000 and above

         (3) Two period—2015 and 2016

         (4) Three age groups—below 25, 25 and under 40, 40 and above

       (ii) Write a note on frequency distribution.   2

Unit—II

4. Answer any *three* of the following :   1×3=3

   (a) Name one measure of location which is also a measure of central tendency.

   (b) Write down the relation between standard deviation and mean square deviation.

   (c) What is the value of β_2 for the leptokurtic distribution?

   (d) What is the Sheppard's correction for μ_2?

5. Answer any *one* of the following :   2

   (a) Which is the ideal measure of central tendency? Discuss why it is called as an ideal measure.

   (b) Define Kurtosis of a frequency distribution.

6. Answer any *one* of the following :

   (a) *(i)* Define standard deviation mentioning its merits.

       (ii) Show that standard deviation is not less than mean deviation from mean.   3+2=5

(b) (i) Define moments.

(ii) Write a short note on co-efficient of variation. 2½+2½=5

UNIT—III

7. Answer any *three* of the following : 1×3=3

(a) What is the value of error sum of square in least square method?

(b) What is the range of correlation coefficient?

(c) When two lines of regression will be perpendicular to each other?

(d) Define positive correlation.

8. Answer any *one* of the following : 2

(a) Prove that correlation coefficient lies between −1 and +1.

(b) Write a note on least square method.

9. Answer any *one* of the following :

(a) Define regression and find the regression equation of Y on X. 2+3=5

(b) Define multiple and partial correlation. Prove that with usual notations

$$1 - R_{1 \cdot 23}^2 = (1 - r_{12}^2)(1 - r_{13 \cdot 2}^2)$$

1½+1½+2=5

UNIT—IV

10. Answer any *three* of the following : 1×3=3

(a) Define event.

(b) What is the probability of certain event?

(c) If A and B are mutually exclusive events, then $n(A \cap B) = ?$

(d) Give one example of impossible event.

11. Answer any *one* of the following : 2

(a) Give the statistical definition of probability.

(b) Find the probability of getting at least two heads when four coins are tossed.

12. Answer any *one* of the following :

(a) Give the classical definition of probability indicating its demerits. 3+2=5

(b) *(i)* Define sample space and sample points.   2

(ii) 25 books are arranged in a shelf. What is the probability that a particular pair of books shall never be together?   3

UNIT—V

13. Answer any *three* of the following :   1×3=3

(a) If A and B are independent events, then what is the value of $P(A|B)$?

(b) If $B \subset A$, then what is the value of $P(A \cap B)$?

(c) If A and B are mutually exclusive events, then $P(A \cup B) = ?$

(d) If A and B are independent, then what is the relation between A^C and B^C?

14. Answer any *one* of the following :   2

(a) Define conditional probability with example.

(b) Prove that

$$P(A \cap B) \le P(A) \le P(A \cup B) \le P(A) + P(B)$$

15. Answer any *one* of the following :

(a) *(i)* State and prove multiplicative theorem of probability.   2½

(ii) 5 men in a company of 20 are graduates. If 3 men are picked out at random, what is the probability of getting at least three graduates?   2½

(b) *(i)* State Bayes' theorem.   1½

(ii) The contents of urns I, II and III are as follows :

Urn I : 1 white, 2 black and 3 red balls

Urn II : 2 white, 1 black and 1 red balls

Urn III : 4 white, 5 black and 3 red balls

One urn is chosen at random and two balls are drawn. They happen to be white and red. What is the probability that they come from urn III?   3½

★ ★ ★