POST-GRADUATE COURSE

Term End Examination — June, 2022/December, 2022
COMMERCE (Old Syllabus)
Paper-VII : BASIC STATISTICAL CONCEPTS & TOOLS
(Up to January 2021 Enrolment Session)

Time : 2 hours]   [Full Marks : 50

Weightage of Marks : 80%

Special credit will be given for accuracy and relevance in the answer. Marks will be deducted for incorrect spelling, untidy work and illegible handwriting. The weightage for each question has been indicated in the margin.

Use of scientific calculator is strictly prohibited.

Module - I

Answer any *two* of the following questions :   12½ × 2 = 25

1. (a) Find the range, mean deviation about median and standard deviation of the following observations :

   13, 84, 68, 24, 96, 109, 84, 27

   (b) State the merits of mean and the demerits of median.

   (1 + 2 + 3) + (3½ + 3)

2. (a) Two regression lines are $x + 2y = 5$ and $2x + 3y = 8, S_x^2 = 12$. Determine the values of $\overline{x}, \overline{y}, S_y^2$ and r. (Symbols have their usual meaning)

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

   (c) Explain the terms multiple correlation coefficient and partial correlation coefficient.   (1 + 1 + 1 + 2) + 3½ + (2 + 2)

3. (a) Show that $\Delta = E - 1$.

   (b) Estimate $f(3)$ from the following table :

x	2	3	4	5	6
$f(x)$	7	–	13	23	37

   (c) The values of $f(x)$ are given below :

x	0	1	2	3	4	5
$f(x)$	1	5	31	121	341	781

   Find the value of $f(2.5)$ by using Lagrange's formula.

   2 + 4 + 6½

4.   (a)   In a population of 500 students, the number of married students is 200. Out of 150 students who failed, 60 belonged to the married group. Using Yule's coefficient of association, find out the extent of association between marriage and failure.

     (b)   Establish the relation between Yule's coefficient of association (Q) and Yule's coefficient of colligation (Y).   6 + 6½

Module - II

Answer any *two* of the following questions :   12½ × 2 = 25

5.   (a)   What is Time Reversal Test ? Show that Time Reversal Test is satisfied by price index number formula of Fisher.

     (b)   Narrate the uses of Cost of Living Index.   (2 + 4) + 6½

6.   (a)   Fit a parabolic trend from the following data :

Year	1981	1982	1983	1984	1985
Production ('000 tons)	22	21	23	22	24

Estimate the production of 1990 by parabolic trend and quarterly trend equation.

     (b)   What is Business forecasting ? Name three important methods used in business forecasting.   (6 + 1½) + (3 + 2)

7.   Write short notes on the following :

     (a)   Rational sub-group.

     (b)   Control chart for number of defects

     (c)   Tolerance Limits.   3½ + 5½ + 3½

8.   Write short notes on any *two* of the following :   6¼ × 2 = 12½

     (a)   Use of Index Number

     (b)   Spearman's Rank Correlation

     (c)   Seasonal Variation

     (d)   Total Quality Management.

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