2025

ECONOMICS — HONOURS

Paper : SEC-1

[Introductory Statistics and Applications (I)]

Full Marks : 75

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Group - A

1. Answer ***any ten*** questions : 2×10

(a) Using an example, clarify how a Pie Chart is drawn.

(b) Find the class-boundaries of a frequency distribution of weight in pounds of a group of boys, where the class-limits used are : $40-42\frac{3}{4}$, $43-45\frac{3}{4}$, $46-48\frac{3}{4}$, $49-51\frac{3}{4}$, $52-54\frac{3}{4}$. The measurements being made nearest to $\frac{1}{4}$th of a pound.

(c) State four desirable properties of a good measure of central tendency.

(d) Two variables X and U are related as $X = 2.5U + 5$ and U has the median 10; find the median of X.

(e) A symmetric distribution has the standard deviation 3. What is the value of the fourth order central moment so that the distribution will be mesokurtic?

(f) The duration of 12 business cycles in the United States from March 1919 to March 1974 were, in months, 28, 36, 40, 64, 63, 88, 48, 58, 44, 34, 117 and 52. Find the median duration of these cycles.

(g) Is coefficient of quartile deviation a relative measure of dispersion? Justify.

(h) Mention two cases when you will prefer median over mean.

(i) For the observations 7, 2, 3, 5, 9, find the mean absolute deviation about the median.

(j) Suppose that a variable X can take three values 10, 5 and 15. Find the first two moments about 12.

(k) In a bi-variate model, why do we get two regression lines?

(l) Construct the scatter diagrams if $r = \mp 1$.

(m) Do you think that for construction of price index numbers the chain-based method is better than the fixed based method? Why?

(n) What is a wholesale price index?

(o) What is a Lorenz curve?

Please Turn Over

Group - B

Answer ***any five*** questions.

2. The average salary of the President and four Vice-Presidents of a company is ₹ 50,000. The Vice-Presidents' average salary is ₹ 45,000. What is the President's salary? 5

3. Evaluate mode as a measure of central tendency. 5

4. The numbers of cars sold by a dealer in a 6-day period were 2, 8, 7, 8, 5, 10. Compute the standard deviation of car sales. 5

5. Suppose that currently the mean wage rate is ₹ 100 per hour with a standard deviation of ₹ 10. Determine the impact on the coefficient of variation if the wages of all workers are (i) increased by ₹ 25 and (ii) increased by 10 per cent. 2+3

6. Write a short note on the Theil's measure of inequality. 5

7. Suppose that 1, 4, 5 and 6 are four observations on a variable X. Compute the (i) first order moment about origin, (ii) third order moment about mean and (iii) second order moment about 2 of the distribution. 5

8. Evaluate correlation coefficient as a measure of association between two variables. 5

9. Laspeyres', Paasche's and Fisher's price index numbers satisfy the factor reversal test— Is the statement correct? Justify. 1+4

Group - C

Answer ***any three*** questions.

10. (a) What do you mean by central tendency? What is a measure of central tendency?

    (b) Find the mean and mode for the following distribution :

Height of students (in cm.)	151-155	156-160	161-165	166-170
No. of students	5	10	20	15

    (c) What can you say about the skewness of the distribution? (1+1)+(3½+3½)+1

11. (a) Three teachers of economics reported mean examination grades of 79, 74 and 82 in their classes, which consisted of 32, 25 and 17 students, respectively. Determine the mean grade for all the classes.

    (b) An airplane travels distances of d_1, d_2 and d_3 miles at speeds v_1, v_2 and v_3 miles per hour, respectively. Show that the average speed is given by V, where

$$\frac{d_1 + d_2 + d_3}{V} = \frac{d_1}{v_1} + \frac{d_2}{v_2} + \frac{d_3}{v_3}.$$

4+6

12. (a) Evaluate standard deviation as a measure of dispersion.

(b) The following Table shows a frequency distribution of grades in an examination in a college. Find the quartile deviation of the distribution.

Grade	Number of students
31-40	1
41-50	3
51-60	11
61-70	21
71-80	43
81-90	32
91-100	9
Total	**120**

4+6

13. (a) Suppose that $2x - 3y = 5$ is the relation between the variables X and Y. If the variance of X be 1.44 and Y has mean 1, then calculate the coefficients of variation of X and Y.

(b) The correlation coefficient between two variables X and Y is $r = 0.60$. If $S_x = 1.50$, $S_y = 2.00$, $\bar{X} = 10$, $\bar{Y} = 20$, find the equation of the regression lines of (i) Y on X and (ii) X on Y.

5+5

14. (a) Why do we use weights to compute price index numbers?

(b) For the following data, find Price Index Numbers using the methods of (i) simple aggregative, (ii) weighted aggregative, (iii) simple average of price relatives and (iv) weighted average of price relatives.

Item	Price in 2016	Price in 2026	Weight
A	140	180	7
B	400	550	10
C	100	250	6
D	125	150	8
E	200	300	4

2+(2×4)