

2025

Ba/EC8.M8

2026

(FYUGP)

(8th Semester)

ECONOMICS

(MINOR)

Paper : EC8.M8

(Advanced Statistical Methods)

Full Marks : 75

Pass Marks : 40%

Time : 3 hours

x15

*The figures in the margin indicate full marks
for the questions.*

(PART : A—OBJECTIVE)

(Marks : 25)

A. Choose the correct answer : $1 \times 15 = 15$

1. If the values of two variables move in same direction

(a) the correlation is said to be non-linear

(b) the correlation is said to be linear

(c) the correlation is said to be negative

~~(d)~~ the correlation is said to be positive

26L/558

(Turn Over)

6. Sylos-Labini's theory of limit pricing focuses on:

a) Product differentiation

c) Short-term profits

b) Advertising expenditure

d) Economies of scale as barriers to entry

(2)

2. Which of the following is true for the coefficient of correlation?
- (a) The coefficient is not dependent on the change of scale
 - (b) The coefficient is not dependent on the change of origin
 - (c) The coefficient is not dependent on both the change of scale and change of origin
 - ☒ (d) None of the above
3. The slope of regression line of Y on X is also referred to as the
- (a) regression co-efficient of X on Y
 - (b) correlation co-efficient of Y on X
 - ☒ (c) regression co-efficient of Y on X
 - (d) correlation co-efficient of X on Y
4. Which model is described as an S-shaped curve, featuring a rapid initial increase followed by a plateau at carrying capacity?
- (a) Exponential growth
 - (b) Linear growth
 - (c) Logistic growth
 - ☒ (d) Gompertz growth

26L/558

(Continued)

5. The Gompertz
- (a) unrestricted
 - (b) constant,
 - ☒ (c) asymmetrical rate decrease
 - (d) a straight
6. In a discrete sum of all probabilities
- (a) zero
 - ☒ (b) one
 - (c) minimum
 - (d) maximum
7. The expected value of a variable is
- ☒ (a) variable
 - (b) standard deviation
 - (c) mean
 - (d) covariance

26L/558

2025
(3)

5. The Gompertz model is often used to describe
- (a) unrestricted population growth
 - (b) constant, linear growth
 - (c) asymmetrical growth where the growth rate decreases exponentially over time
 - (d) a straight line on a normal scale
6. In a discrete probability distribution, the sum of all probabilities is always equal to
- (a) zero
 - (b) one
 - (c) minimum
 - (d) maximum
7. The expected value of a discrete random variable is equal to its
- (a) variance
 - (b) standard deviation
 - (c) mean
 - (d) covariance

26L/558

(Turn Over)

(4)

8. What is the shape of a normal distribution curve?
- (a) Flat
 - (b) U-shaped
 - ☒ (c) Bell-shaped
 - (d) J-shaped
9. Which of the following is a probability sampling method?
- (a) Quota sampling
 - (b) Snowball sampling
 - (c) Purposive sampling
 - ☒ (d) Simple random sampling
10. The difference between a sample statistic and the population parameter is called
- (a) non-random error
 - (b) sampling error
 - (c) bias
 - ☒ (d) standard error
11. The standard deviation of the sampling distribution of a statistic is called
- (a) standard error
 - ☒ (b) sampling error
 - (c) variance
 - (d) parameter

12.

13.

14.

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12. What effect does increasing the sample size have on the sampling error?

- (a) It increases the error
- ☒ (b) It decreases the error
- (c) It has no effect
- (d) It doubles the error

13. Which of the following is a characteristic of a good estimator?

- (a) Unbiasedness
- (b) Consistency
- (c) Efficiency
- ☒ (d) All of the above

14. The process of determining the range of values within which a population parameter is expected to lie is called

- ☒ (a) point estimation
- (b) interval estimation
- (c) hypothesis testing
- (d) statistical testing

(6)

15. Which test is appropriate for comparing the mean of two large-sized samples ($n > 30$) ?

- (a) t-test
- ☒ (b) z-test
- (c) Chi-square test
- (d) F-test

B. Write short notes on the following (any five) :

2×5=10

1. Multiple correlations
2. Regression lines
3. Parabola
4. Exhaustive and Favourable cases in probability analysis
5. Sampling distribution
6. Standard error
7. Hypothesis

26L/558

(Continued)

Answer

1. (a)

(b)

2. (a)

(b)

26L/558

(7)

(PART : B—DESCRIPTIVE)

(Marks : 50)

Answer five questions, taking one from each Unit.

UNIT—1

1. (a) What are the special characteristics of Karl Pearson's coefficient of correlation? From the following table, calculate the coefficient of correlation by Karl Pearson's method : 4+6=10

X	:	6	2	10	4	8
Y	:	9	11	5	8	7

Or

- (b) Explain the concepts of 'regression' and 'regression equation'. Point out the usefulness of regression analysis in dealing with business problems. 4+6=10

UNIT—2

2. (a) Solve the following non-linear equations : 5+5=10

(i) $x^2 - x - 56 = 0 \rightarrow 8, -7$

(ii) $x^2 + 35 = 11x + 5 \rightarrow 5, 6$

Or

- (b) What is exponential series? Explain its properties. 4+6=10

(8)

UNIT—3

3. (a) What is compound probability? A card is drawn from a well-shuffled pack of playing cards. Find the probability that it is either a diamond or a king. $4+6=10$

Or

- (b) What is normal distribution? Explain its properties. $3+7=10$

UNIT—4

4. (a) What is sampling error? Explain the sources of sampling error in statistical analysis. $2+8=10$

Or

- (b) What are the characteristics of sampling distribution? 10

UNIT—5

5. (a) State and explain the procedures (steps) of testing hypothesis. 10

Or

- (b) What is *F*-distribution? Explain briefly its properties and applications. $2+8=10$

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