

THIRD SEMESTER B.A. DEGREE EXAMINATION, NOVEMBER 2019

(CUCBCSS—UG)

Economics

ECO 3B 03—QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS—I

Time : Three Hours

Maximum : 80 Marks

Section A (Objective Type)

*Answer all questions.**Each question carries ½ mark.*

1. If $AA^T = I$, the matrix A is called _____.
(a) Diagonal matrix. (b) Symmetric matrix.
(c) Orthogonal matrix. (d) Skew symmetric.
2. If $|A| = 0$, the matrix A is called _____.
(a) Symmetric matrix. (b) Singular matrix.
(c) Non-singular matrix. (d) None of these.
3. The value of $\log_3 81$ is _____.
(a) 2. (b) 3.
(c) 4. (d) 5.
4. _____ is a positional average.
(a) Mean. (b) Mode.
(c) Quartile. (d) None of these.
5. A diagram of circle is _____.
(a) Pie diagram. (b) Line diagram.
(c) Bar diagram. (d) None of these.
6. If $8x + 2 = 18$, the x is equal to :
(a) 2. (b) 4.
(c) 6. (d) 8.

Turn over

7. The function $y = 3e^x$ is called :
- (a) Multivariate function. (b) Exponential function.
(c) Explicit function. (d) Implicit function.
8. _____ is the middle most value of the observations when they are arranged in ascending order of magnitude.
- (a) Mean. (b) Mode.
(c) Median. (d) None of these.
9. If X and Y related using the relation $Y = -4X$, the correlation between X and Y is _____
- (a) 0. (b) + 1
(c) - 1. (d) None of these.
10. Correlation co-efficient is _____ value.
- (a) Absolute value. (b) Relative value.
(c) Average value. (d) None of these.
11. If the two regression coefficients are 0.2 and 0.8, the correlation co-efficient is _____.
- (a) 0.2. (b) 0.4.
(c) 0.8. (d) None of these.
12. The point of intersection of the two regression lines is _____.
- (a) (- 1, + 1) (b) (0, 0).
(c) (x, y) (d) None of these.

(12 × ½ = 6 marks)

Section B (Short Answer Type)

*Answer any ten questions.
Each question carries 2 marks.*

13. Find the value of $(81/16)^{3/4}$.
14. Explain system of quadratic equations.
15. Find A^{-1} , for the matrix $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$.

16. Define percentile.
17. Explain adjoint of a matrix.
18. Define cofactor of a matrix.
19. Explain Cramer's rule for solving linear equations.
20. What are the limitations of statistics ?
21. If $X = 345.02 \times 273.43 \times 496.56$, find $\log X$.
22. Describe frequency polygon.
23. Explain the use of Gini coefficient.
24. Describe Karl-Pearson's co-efficient of correlation.

(10 × 2 = 20 marks)

Section C (Short Essay/Problem Type)

Answer any six questions.

Each question carries 5 marks.

25. Explain the origin and development of statistics.
26. Find the regression equation of X on Y for the following data :

X	:	28	26	32	31	37	30	36	34	39	40
Y	:	75	74	82	81	90	88	85	92	92	95
27. What is the mathematical relationship among average revenue, marginal revenue and elasticity ?
28. Explain various measures of skewness.
29. Draw a histogram and frequency polygon for the following data :

Class	:	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	:	7	10	20	13	17	10	14	9
30. Compute rank correlation coefficient for the following data :

X	:	60	48	36	52	41	58	13
Y	:	75	51	39	55	49	62	17

Turn over

31. Examine whether the matrix A is non-singular or not :

$$A = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 6 & 9 \\ 2 & 4 & 6 \end{pmatrix}$$

32. Explain the graphical method of obtaining the median.

(6 × 5 = 30 marks)

Section D (Essay Type)

Answer any two questions.

Each question carries 12 marks.

33. Compute arithmetic mean, median and mode from the following data and verify the relation between them ?

Class	:	0–10	10–20	20–30	30–40	40–50	50–60	60–70	70–80	80–90
Frequency	:	2	4	10	15	22	18	12	8	5

34. Explain skewness. Find the quartile coefficient of skewness for the following data :

Class	:	0–5	5–10	10–15	15–20	20–25	25–30	30–35
Frequency	:	3	10	14	25	17	9	2

35. Solve the simultaneous equations :

(i) $X - Y = 6$ and $X^2 + Y^2 = 68$.

(ii) $X + Y = 49$ and $X^2 - 2Y^2 = 178$.

36. Find $A^3 + 4A^2 - A - 12I$, where

$$A = \begin{pmatrix} 1 & 2 & 5 \\ 2 & 3 & 4 \\ 4 & 5 & 8 \end{pmatrix}$$

(2 × 12 = 24 marks)