

**THIRD SEMESTER B.A. DEGREE EXAMINATION
NOVEMBER 2017**

(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. $2x^3 - 54 = 0$, the value of x is _____.
(a) 9. (b) - 9.
(c) 3. (d) - 3.
2. Find the value of $[256]^{\frac{1}{4}}$ is _____.
(a) 16. (b) 8.
(c) 4. (d) 2.
3. For an orthogonal matrix $AA^T =$ _____.
(a) Identity matrix. (b) The matrix A.
(c) Zero matrix. (d) None of these.
4. The order of a matrix A is $m \times n$, that of B is $n \times q$ then the order of AB is _____.
(a) $n \times n$. (b) $m \times n$.
(c) $m \times q$. (d) $n \times q$.
5. A function $f(x)$ is called an even function, if _____.
(a) $f(-x) = -f(x)$. (b) $f(-x) = f(x)$.
(c) $f(x^2) = f(x)$. (d) None of these.
6. Which of the following is a mathematical average ?
(a) Median. (b) Mode.
(c) Geometric mean. (d) None of these.

7. In case of time related data, which of the following is preferred ?
- (a) A M. (b) G M.
(c) H M. (d) Median.
8. Median and _____ decile are same.
- (a) 7th. (b) 5th.
(c) 2nd. (d) None of these.
9. Square root of variance is known as :
- (a) Quartile deviation. (b) Mean deviation.
(c) Standard deviation. (d) Range.
10. Gini Coefficient is associated with :
- (a) Lorenz curve. (b) Ogives.
(c) Frequency curve. (d) None of these.
11. If X and Y are perfectly obeys the equation $2x - 5y + 2 = 0$, the correlation between X and Y is _____.
- (a) - 1. (b) + 1.
(c) 0. (d) None of these.
12. The regression co-efficient of x on y is _____.
- (a) $\frac{\text{Cov}(X, Y)}{V(Y)}$. (b) $\frac{\text{Cov}(X, Y)}{V(X)}$.
(c) $\frac{\text{Cov}(X, Y)}{SD(Y)}$. (d) None of these.

(12 × ½ = 6 marks)

Section B (Short Answer Type)

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

13. Find the value of $[16]^{\frac{1}{4}} + \left[\frac{1}{8}\right]^{\frac{1}{3}}$.

14. If $\log_{\sqrt{8}} x = \frac{4}{3}$, find x .
15. Define the conditions for maximum of a function.
16. When two matrices will become equal ?
17. If the matrix $A = \begin{bmatrix} -3 & 4 & 2 \\ 7 & 0 & 5 \\ 6 & -4 & -1 \end{bmatrix}$. Write A^T .
18. Define orthogonal matrix.
19. Solve for x , if $\frac{2}{x} + \frac{x}{2} = 2$.
20. Define Geometric Mean.
21. The demand and supply curves are $D = 19 - 5p$ and $S = 5p - 1$. Find the equilibrium price.
22. Find the derivative of $x \cos x + 2e^x$ with respect to x .
23. Find the roots of $2x^2 - 5x + 2 = 0$.
24. Given the regression lines y on x as $12x + 21y + 10 = 0$. Obtain the regression co-efficient of y on x .

(10 × 2 = 20 marks)

Section C (Short Essay/Problem Type)

Answer any six questions.

Each one carries 5 marks.

25. If $A = \begin{bmatrix} 2 & -4 \\ 3 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 8 & 4 \\ 6 & 5 \end{bmatrix}$ verify whether $AB = BA$.
26. Define coefficient of variation. Obtain coefficient of variation of 20, 22, 19, 22, 23.
27. Find the equilibrium price and quantity, if the demand and supply equations are respectively, $2p = 14 - x$ and $12p = 14 + x$.
28. Describe the various measures of dispersion.
29. Obtain Pearson's measure of skewness for a group of 10 items with their sum 452, sum of squares 24270 and the mode 43.7.
30. Explain the method of Lorenz curve and Gini Co-efficient.

31. If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$, show that $A^2 - 4A - 5I = 0$.

32. Write a note on rank correlation co-efficient.

(6 × 5 = 30 marks)

Section D (Essay Type)

Answer any **two** questions.

Each one carries 12 marks.

33. Using Cramer's rule solve the equations to get the values of x , y and z .

$$2x + y + z = 1$$

$$x - y + 4z = 0$$

$$x + 2y - 2z = 3$$

34. Define Kurtosis. How is it measured? Find the co-efficient of Kurtosis based on quartiles to the following data :

Class	:	1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	26 - 30	31 - 35
Frequency	:	3	4	68	30	10	6	2

35. Matrix A is given by $A = \begin{bmatrix} 1 & 2 & 3 \\ 5 & 7 & 4 \\ 2 & 1 & 3 \end{bmatrix}$, show that $A A^{-1} = I$.

36. Find the regression lines and predict the value for x , when $y = 90$ and the value of y when $x = 100$.

X	:	65	66	67	67	68	69	70	72
Y	:	67	68	65	68	72	72	69	71

(2 × 12 = 24 marks)