

**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  $[256]^{1/4}$  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.

Turn over

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) 7<sup>th</sup>. (b) 5<sup>th</sup>.  
(c) 2<sup>nd</sup>. (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)  $\frac{\text{Cov}(X, Y)}{\text{SD}(Y)}$  (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.

Turn over

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)