D 12459 (Pages : 4) Name.....

Reg. No.....

THIRD SEMESTER B.A. DEGREE EXAMINATION, NOVEMBER 2016

(CUCBCSS—UG)

Core Course—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. $\left[4x^6\right]^{\frac{1}{2}} - 16 = 0$, the value of x is ————.

   (i) 6. (ii) 2.

   (iii) 3. (iv) 1.

2. For a matrix A, $A^T = A$, the matrix is, ———— matrix.

   (i) Symmetric. (ii) Skewsymmetric.

   (iii) Orthogonal. (iv) Identity.

3. $\log_a b \times \log_b a =$ ————.

   (i) 0. (ii) 1.

   (iii) $\log a - \log b$. (iv) 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 ————.

   (i) $n \times n$. (ii) $m \times n$.

   (iii) $m \times q$. (iv) $n \times q$.

5. When TR = $100 - x^2$, the MR is ————.

   (i) 100. (ii) $-2x$.

   (iii) $-x^2$. (iv) None of these.

6. Which of the following is a positional average ?

   (i) Harmonic mean. (ii) Geometric mean.

   (iii) Median. (iv) None of these.

Turn over

7. The presence of extreme observations affects ———.

(i) Arithmetic mean. (ii) Mode.

(iii) Median. (iv) None of these.

8. For a set of N observations, median class is the class in which ——— observation is lying ?

(i) $\left(\frac{N}{4}\right)^{th}$. (ii) $\left(\frac{N}{2}\right)^{th}$.

(iii) $\left(\frac{3N}{4}\right)^{th}$. (iv) None of these.

9. Quartile deviation is ———.

(i) $\frac{Q_3 + Q_1}{2}$. (ii) $\frac{Q_3 - Q_1}{2}$.

(iii) $\frac{Q_3 - Q_1}{Q_2}$. (iv) $\frac{Q_3 + Q_1}{Q_2}$.

10. Mean of a symmetric distribution is 8. The mode is ———.

(i) 8. (ii) 4.

(iii) 2. (iv) 0.

11. If X and Y are perfectly obeys the equation $2x + 5y - 2 = 0$, the correlation between X and Y is ———.

(i) + 1. (ii) – 1.

(iii) 0. (iv) None of these.

12. The regression coefficient of y on x is ———.

(i) $\frac{Cov\,(X, Y)}{SD\,(Y)}$. (ii) $\frac{Cov\,(X, Y)}{SD\,(X)}$.

(iii) $\frac{Cov\,(X, Y)}{V\,(Y)}$. (iv) 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 $\left[\frac{1}{25}\right]^{-\frac{3}{2}}$.

14. Define rational number.

15. State the product rule and quotient rule on logarithm.

16. Define limit of a function.

17. Define orthogonal matrix.

18. If the matrix $A = \begin{bmatrix} 4 & 2 \\ 0 & 5 \end{bmatrix}$. Find A^2.

19. If $A = \begin{bmatrix} -3 & 4 & 2 \\ 7 & 0 & 5 \\ 6 & -4 & -1 \end{bmatrix}$, find $|A|$.

20. Define harmonic mean.

21. Find the marginal cost and average cost if the total cost is $1000 + 100x - 10x^2 + x^3$.

22. Total revenue function of a firm is $R = 21x - x^2$. Find the marginal revenue when 10 units are sold.

23. Test whether $f(x) = 2x^2 - 8x + 2$ is minimum at $x = 2$.

24. Given the regression lines $9x - 4y + 15 = 0$ and $25x - 6y - 7 = 0$. Obtain the means of x and y.

(10 × 2 = 20 marks)

Section C (Short Essay/Problem Type)

Answer any **six** *questions.*
Each one carries 5 marks.

25. For a given matrix $A = \begin{bmatrix} -3 & 4 \\ 3 & 2 \end{bmatrix}$. Find $(A^T)^T A$.

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. Define kurtosis. What are the various measures of kurtosis ?

29. What are regression coefficients ? What are their properties ?

30. Explain the method of Lorenz curve and Gini Coefficient.

31. If $A = \begin{bmatrix} 5 & 7 & 2 \\ 2 & 3 & 1 \\ 4 & 6 & 2 \end{bmatrix}$, show that A is singular.

32. Write a note on graphical methods for correlation and regression.

(6 × 5 = 30 marks)

Section D (Essay Type)

Answer any **two** *questions.*
Each one carries 12 *marks.*

33. Using matrix inverse method 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 skewness. How is it measured? Find the quartile coefficient of skewness 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. Define rank correlation coefficient. The following are the ranks obtained by 10 students in Economics and Mathematics :

Economics	:	1	2	3	4	5	6	7	8	9	10
Mathematics	:	1	4	2	5	3	9	7	10	6	8

To what extent is the knowledge of students in the two subjects related ?

(2 × 12 = 24 marks)