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.

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) 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) $\dfrac{\text{Cov}(X, Y)}{V(Y)}$.   (b) $\dfrac{\text{Cov}(X, Y)}{V(X)}$.

    (c) $\dfrac{\text{Cov}(X, Y)}{SD(Y)}$.   (d) None of these.

$(12 \times \frac{1}{2} = 6 \text{ marks})$

Section B (Short Answer Type)

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

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

14. If $\log_{\sqrt{8}} x = \dfrac{4}{3}$, 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 $\dfrac{2}{x} + \dfrac{x}{2} = 2$.

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.

$(10 \times 2 = 20 \text{ marks})$

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.

$(6 \times 5 = 30 \text{ marks})$

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

$(2 \times 12 = 24 \text{ marks})$

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

(Multiple Choice Questions for SDE Candidates)

Time : 15 Minutes	Total No. of Questions : 20	Maximum : 20 Marks

INSTRUCTIONS TO THE CANDIDATE

1. This Question Paper carries Multiple Choice Questions from 1 to 20.

2. The candidate should check that the question paper supplied to him/her contains all the 20 questions in serial order.

3. Each question is provided with choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and enter it in the main answer-book.

4. The MCQ question paper will be supplied after the completion of the descriptive examination.

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

(Multiple Choice Questions for SDE Candidates)

1. Diagrams are tools of :

   (A) Collection of data.   (B) Analysis of data.

   (C) Summarization of data.   (D) Presentation of data.

2. Histogram is useful to determine :

   (A) Mean.   (B) Median.

   (C) Mode.   (D) All these.

3. The most commonly used measure of central tendency is :

   (A) AM.   (B) Median.

   (C) Mode.   (D) HM.

4. The value which occurs with the maximum frequency is called :

   (A) Median.   (B) Mode.

   (C) Mean.   (D) None.

5. To find median, arrange the data in :

   (A) Ascending order.

   (B) Descending order.

   (C) Ascending order or descending order.

   (D) No order.

6. In the function $Y = f(X)$, X is the :

   (A) Dependent variable.   (B) Independent variable.

   (C) Constant.   (D) None of these.

7. The function $y = x^3 + 3x$, is :

   (A) An odd function.   (B) An even function.

   (C) Quadratic function.   (D) Linear function.

8. The parabola $X^2 = -4py$ lies completely :

   (A) Above the X-axis.   (B) Right side of the Y-axis.

   (C) Below the X-axis.   (D) Left side of Y-axis.

9. The indifference curve analysis is developed by :

   (A) Edgeworth.   (B) R.A. fisher.

   (C) Cobb-Douglas.   (D) Wilfredo pareto.

10. An important tool of indifference curve analysis is :

    (A) Marginal propensity to consume. (B) Marginal rate of substitution.

    (C) Marginal propensity to save.   (D) Marginal utility.

11. A demand function is ————.

    (A) Continuous function.   (B) Constant function.

    (C) Decreasing function.   (D) Increasing function.

12. The common root of $x^2 - 5x + 6 = 0$ and $3x^2 - 5x - 2 = 0$ is :

    (A) 1.   (B) 2.

    (C) 3.   (D) 4.

13. In a determinant if two rows or columns are identical its value is :

    (A) 0.   (B) 1.

    (C) -1.   (D) None of these.

14. Which of the following is a singular matrix :

    (A) $\begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$.   (B) $\begin{bmatrix} 3 & 6 \\ 1 & 2 \end{bmatrix}$.

    (C) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$.   (D) $\begin{bmatrix} 1 & 3 \\ 2 & 5 \end{bmatrix}$.

15. The matrix $A = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 0 & 0 \\ -1 & 0 & 0 \end{bmatrix}$ is :

    (A) Symmetric.   (B) Diagonal.

    (C) Skew Symmetric.   (D) Triangular.

16. If $\log_a 64 = 3$, then a is equal to :

    (A) 3.   (B) 4.

    (C) 2.   (D) None of these.

17. 216 to the base $\sqrt{6}$ is :

    (A) 6.   (B) $\dfrac{2}{6}$.

    (C) $\sqrt{-3}$.   (D) None of these.

18. The logarithm of a negative number is :

    (A) Positive.   (B) Negative.

    (C) Cannot determined.   (D) None of these.

19. If $(2x + 1)(4x - 1) = 0$, the roots are :

    (A) 1,–1.   (B) $\dfrac{1}{2}, \dfrac{1}{4}$.

    (C) $\dfrac{-1}{2}, \dfrac{1}{4}$ (D) 2,2.

20. Matrix A is said to be idempotent matrix when :

    (A) $A = A^{-1}$.   (B) $A = A^2$.

    (C) $A = A^I$.   (D) $A = IA$.