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 × 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.

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

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

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