

**FOURTH SEMESTER B.A. DEGREE (SUPPLEMENTARY/IMPROVEMENT)  
EXAMINATION, MAY 2016**

(UG—CCSS)

Core Course—Economics

**EC 4B 05—QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS—II**

(2013 Admissions)

Time : Three Hours

Maximum : 30 Weightage

**I. Objective type questions. Answer all *twelve* questions.**

1 If  $a, b, c, d$  are in arithmetic progression then  $ad =$  \_\_\_\_\_

2  $\log_e e^2 =$  \_\_\_\_\_

3  $2 + 4 + 6 + \dots + 2n =$  \_\_\_\_\_

4 If  $A$  is any set, then  $A \cup \phi =$  \_\_\_\_\_

5  $f(x) = x^2 + 25$  is an odd function in  $x$ . State true or False.

6 Slope of the line  $y = 4x - 5$  is \_\_\_\_\_

7 If  $\frac{x+3}{3x} = 2$ , then  $x =$  \_\_\_\_\_

8 Matrix multiplication is **always** commutative. State true or False.

9 If  $A$  is a matrix of order  $3 \times 2$  then the order of  $AT$  is \_\_\_\_\_

10  $\begin{vmatrix} a & a \\ b & b \end{vmatrix} =$  \_\_\_\_\_

11  $\lim_{x \rightarrow a} \frac{x^4 - a^4}{x - a} =$  \_\_\_\_\_

12  $\frac{d}{dx} x =$  \_\_\_\_\_

(12 x 3 weightage)

II. Short answer type questions. Answer all *nine* questions :

- 13 If  $\log_{10} 2 = 0.3010$  and  $\log_{10} 3 = 0.4771$ , find the value of  $\log_{10} 6$ .
- 14 Find the harmonic mean of 6, 10.
- 15 Define power set.
- 16 Define function.
- 17 Find the equation of a straight line having slope  $2/3$  and passing through the point (1, 1).
- 18 Distinguish between singular and non-singular matrix.
- 19 Define skew symmetric matrix.
- 20 Differentiate the  $e^x \log x$  with respect to  $x$ .
- 21 If  $z = xy + 7$ , find  $\frac{\partial^2 z}{\partial x \partial y}$ .

(9 x 1 = 9 weightage)

III. Short essay or paragraph questions. Answer any *five* questions

- 22 Find three numbers in arithmetic progression whose sum is 12 and the sum of whose squares is 56.
- 23 Find the equilibrium price and quantity if  $x = 25 - 3p$  and  $x = 2p + 10$  respectively denote the demand and supply curves.
- 24 Solve the equation  $\log(x^2 - 9) - \log(x - 9) = \log 16$ .
- 25 State the properties of determinants.
- 26 Find the minimum value of the function  $f(x) = x\sqrt{x} + 1$ .
- 27 Define homogeneous function state Euler's theorem.
- 28 Find the points of inflexion of the curve  $y = (\log_e x)^2$ .

(5 x 2 = 10 weightage)

IV. Essay questions. Answer any *two* questions :

- 29 Solve the following equations by Cramer's rule

$$3x + 3y - z - 11 = 0, 2x - y + 2z - 9 = 0, 4x + 3y + 2z - 25 = 0.$$

$$30 \text{ If } A = \begin{vmatrix} 7 & -1 & 1 & 16 \\ -3 & 5 & -7 & \\ 1 & -2 & 3 & \end{vmatrix}, \text{ find } A^{-1}. \text{ Verify that } AA^{-1} = I.$$

$$31 \text{ If } z = x^3 - y^3 + 3x^2y \text{ show that } x \frac{\partial^2 z}{\partial x^2} + y \frac{\partial^2 z}{\partial y^2} = 3z.$$

(2 x 4 = 8 weightage)