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FOURTH SEMESTER B.A. DEGREE EXAMINATION, APRIL/MAY 2015

(U.G.–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 are in arithmetic progression then $b - a =$ ————.

2 $\log_{10} 1000 =$ ————.

3 $16^{\frac{3}{4}} =$ ————.

4 If A is any set, then $A \cap \phi =$ ————.

5 If $f(x)$ is an even function, then $f(-x) =$ ————.

6 $y = 3x + 5$ is a straight line. State True *or* False.

7 If $\dfrac{x}{3} + \dfrac{x}{2} = 5,$ then $x =$ ————.

8 Matrix addition is commutative. State True *or* False.

9 If A is a symmetric matrix then $A^T =$ ————.

10 If $\begin{vmatrix} 1 & -3 \\ 3 & x \end{vmatrix} = 0,$ then $x =$ ————.

11 $f(x) = \dfrac{x^2 - 4}{x - 2}$ is not continuous at $x =$ ————.

12 $\dfrac{d^3}{dx^3} e^{-x} =$ ————.

(12 × ¼ = 3 weightage)

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

13 Distinguish between finite and infinite sets.

14 Define disjoint sets.

15 If $A = \{1, 2\}$ and $B = \{a\},$ find $A \times B$.

Turn over

16 What do you mean by a linear equation ? Give one example.

17 Define the terms domain and range.

18 Give one example for upper triangular matrix.

19 Find all cofactors of $\begin{vmatrix} 3 & 7 \\ 1 & 2 \end{vmatrix}$.

20 Define convexity of a function.

21 If $y = x \log x$, find the value of $\dfrac{dy}{dx}$.

(9 × 1 = 9 weightage)

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

22 If $A = \{0, 1, 2, 5, 7\}$, $B = \{1, 2, 3\}$, $C = \{5, 7, 8\}$, find $A \cup B \cup C$ and $A \cap B \cap C$.

23 Solve the equation $x (x - 3) = 2 (10 - x)$.

24 If the third and seventh terms of a geometric progression are 2 and 1/8 respectively, find its tenth term.

25 Draw the graph of $y = x^2$.

26 If $A = \begin{bmatrix} 1 & 0 \\ 2 & 3 \end{bmatrix}$, find the value of A^2.

27 Find the inverse of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 3 & 3 \\ 2 & 4 & 3 \end{bmatrix}$.

28 Solve the equation $x - 2y = 16$ and $3x + y = -1$ by using Cramer's rule.

(5 × 2 = 10 weightage)

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

29 If $\begin{vmatrix} x^3 + 1 & x^2 & x \\ y^3 + 1 & y^2 & y \\ z^3 + 1 & z^2 & z \end{vmatrix} = 0$ with $x \ne y \ne z$, then show that $xyz = 1$.

30 If $z = \log \sqrt{x^2 + y^2}$, prove that $\dfrac{\partial^2 z}{\partial x^2} + \dfrac{\partial^2 z}{\partial y^2} = 0$.

31 If $x^y = y^x$, show that $\dfrac{dy}{dx} = \dfrac{y (y - x \log y)}{x (x - y \log x)}$.

(2 × 4 = 8 weightage)