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

(UG—CCSS)

Core Course—Economics

EC 4B 05—QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS—I

(2009-2012 Admissions)

Time : Three Hours   Maximum : 30 Weightage

Part A

Answer **all** *questions.*
Weightage 1 *for bunch of* **four.**

1. The sum of root of the quadratic equation $ax^e + bx\ c = 0$ is zero, when :

   (a) $a = 0$.   (b) $b = 0$.

   (c) $c = 0$.   (d) $a + b = 0$.

2. The equation of the straight line having equal intercepts, say k constitute a triangle of area :

   (a) $\dfrac{k}{2}$.   (b) $\dfrac{k^2}{2}$.

   (c) $2k$.   (d) 2

3. The diagonal elements of a skew symmetric matrix are :

   (a) Zeros.   (b) Zero or one.

   (c) Negative numbers.   (d) Ones.

4. The slope of the equation x + y = 0 is :

   (a) 1.   (b) — 1.

   (c) 0.   (d) None of these.

5. If $\log_s a = 3$ then $\log_e b$ is ————

6. If A and B are any two non-empty sets, then the number of possible relations from A to B is ————

7. If log (x + y) = log x + log y, then $x = y =$ ————

Turn over

8. **The formula for compound interest is**

9. **Write the mathematical formula for obtaining radius of curvature.**

10. **Give an example of a non-singular matrix.**

11. **What is the range of a real determinant ?**

12. **Find the 5th order derivative of x^5.**

(12 x ¼ = 3 weightage)

Part B (Short Answer Questions)

*Answer **all** questions.*
Each carries 1 weight.

13. **The sum of first 24th and 25th terms of an AP are respectively 2100 and 2300. Find the 25th term of the AP.**

14. **What is compounding ?**

15. **Find the minor of the elements 5 in** $\begin{pmatrix} 5 & 6 \\ 10 & \bullet \end{pmatrix}$

16. **What is meant by discounting ?**

17. **Define skew-symmetric matrix with an example.**

18. **Sketch a rough shape of $e^{-}x$ for $x > 0$.**

19. **Find $\dfrac{\partial z}{\partial x}$ if $z \quad x^3 + 3x^2 y - 4x \cos y$.**

20. **Write the formula for compound interest.**

21. **Define curvature.**

(9 x 1 = 9 weightage)

Part C

*Answer any **five** questions.*
*Each question carries a **weightage** of 2.*

22. **Find the equation of the straight line parallel to $2x - 3y + 10 = 0$ and passes through $(-6, -2)$.**

23. **State and prove any two properties of determinants.**

24. **Show that** $\begin{vmatrix} 1 & 1 & 1 \\ a & & \\ a^2 & b^2 & c^2 \end{vmatrix} = -(a-b)(b-c)(a-c).$

25. Show that the function $x^3 - 9x^2 + 27x + 60$ has neither a maximum nor a minimum at $x = 3$.

26. Show with an example that matrix multiplication is anti-commutative.

27. Find the sum of first 16 terms of the GP with nth term as $a_n = \dfrac{2n - 1}{3^n}$, $n = 1, 2, \ldots$

28. Explain present value and internal rate of return.

$(5 \text{ x } \quad = 10 \text{ weightage})$

Part D

Answer any **two** *questions.*
Each question carries a **weightage** *of* 4.

29. Solve the following system of equations using inverse method

    $x + 2y + 3z = 10, 2x - 4y + z = -1, -x + 2y + 4z = 5$.

30. Sketch the graph of following functions :

    (a) $y = x^2 + \dfrac{1}{x}$ (b) $3x - 4y - 12 = 0$.

31. A certain sum was borrowed at the rate of 20 % per annum compounded annually. The sum is returned in 3 equal instalments of Rs. 1,728 each. Find the sum borrowed.

$(2 \text{ x } 4 = 8 \text{ weightage})$