

C81894

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Name.....

Reg. No.....30.....

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.

- The sum of root of the quadratic equation  $ax^2 + bx + c = 0$  is zero, when :
  - $a = 0$ .
  - $b = 0$ .
  - $c = 0$ .
  - $a + b = 0$ .
- The equation of the straight line having equal intercepts, say  $k$  constitute a triangle of area :
  - $\frac{k}{2}$ .
  - $\frac{k^2}{2}$ .
  - $2k$ .
  - $\frac{k^2}{4}$ .
- The diagonal elements of a skew symmetric matrix are :
  - Zeros.
  - Zero or one.
  - Negative numbers.
  - Ones.
- The slope of the equation  $x + y = 0$  is :
  - 1.
  - 1.
  - 0.
  - None of these.
- If  $\log_b a = 3$  then  $\log_a b$  is \_\_\_\_\_.
- If A and B are any two non-empty sets, then the number of possible relations from A to B is \_\_\_\_\_.
- 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 5<sup>th</sup> order derivative of  $x^5$ .

(12 × ¼ = 3 weightage)

**Part B (Short Answer Questions)**

*Answer all questions.  
Each carries 1 weight.*

13. The sum of first 24<sup>th</sup> and 25<sup>th</sup> terms of an AP are respectively 2100 and 2300. Find the 25<sup>th</sup> term of the AP.
14. What is compounding ?
15. Find the minor of the elements 5 in  $\begin{pmatrix} 5 & 6 \\ 4 & 10 \end{pmatrix}$ .
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  $\frac{\partial z}{\partial x}$  if  $z = x^3 + 3x^2 y - 4x \cos y$ .
20. Write the formula for compound interest.
21. Define curvature.

(9 × 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 
$$\begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{vmatrix} = -(a-b)(b-c)(a-c).$$

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  $n^{\text{th}}$  term as  $a_n = \frac{2^{n-1}}{3^n}, n = 1, 2, \dots$
28. Explain present value and internal rate of return.

(5 × 2 = 10 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)  $y = x^2 + \frac{1}{x}$ .      (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 × 4 = 8 weightage)