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**THIRD SEMESTER B.A. DEGREE (SUPPLEMENTARY/IMPROVEMENT)  
EXAMINATION, NOVEMBER 2015**

(UG—CCSS)

Core Course—Economics

EC 3B 03—QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS—I

(2009—2012 Admissions)

Maximum : 30 Weightage

Time : Three Hours

**Part A**

*Answer all questions.  
Weightage 1 for a bunch of 4.*

1. The roots of the equation  $x^2 - 36 = 0$  are :  
(a)  $\pm 6$ . (b)  $\pm 36$ .  
(c) 4, 9. (d) 36, 1.
2. The equation of the straight line having  $x$  intercept 10 and  $y$  intercept 20 is :  
(a)  $2x + y = 20$ . (b)  $x + 2y = 20$ .  
(c)  $-2x + y = 20$ . (d)  $-x + 2y = 20$ .
3. The diagonal elements of a skew symmetric matrix are :  
(a) Zeros. (b) Zero or one.  
(c) Negative numbers. (d) Ones.
4. The  $y$  intercept of the straight line  $2x + y = 6$  is :  
(a)  $\frac{1}{2}$ . (b)  $-\frac{1}{2}$ .  
(c) 2. (d) None of these.
5. If  $\log_x x = 0.5$  then  $\log_x y$  is \_\_\_\_\_.
6. If  $x$  and  $y$  are two positive numbers and  $\log(x + y) = \log x + \log y$ , then  $x = y =$  \_\_\_\_\_.
7. The domain of the function  $\sin x$  is \_\_\_\_\_.
8. The formula for compound growth is \_\_\_\_\_.
9. An example of a diagonal matrix is \_\_\_\_\_.
10. The signed minor of an element of a matrix is called \_\_\_\_\_.

Turn over

11. The sum of first 11 terms of an A.P is 121. The 6th term of A.P is \_\_\_\_\_.
12. The third order derivative of  $y = 2x^2 - 10x + 19$  \_\_\_\_\_.

(12 × ¼ = 3 weightage)

**Part B (Short Answer Questions)***Answer all questions.**Each question carries 1 weightage.*

13. Find the sum of first 20 odd natural numbers.
14. What is compounding ?
15. Find the cofactor of the element  $-5$  in  $\begin{pmatrix} 10 & 6 \\ 4 & -5 \end{pmatrix}$ .
16. What is meant by simple growth ?
17. What is meant by radius of curvature ?
18. Find the number of digits in  $3^{10}$  given  $\log_{10} 3 = 0.4771$ .
19. Find the partial derivative of the function  $w = x^4 - 5x^2y + y^2$  with respect to  $x$ .
20. Find the compound interest on certain sum, say Rs. 1,00,000 invested for a period of one year with annual rate of interest 10%.
21. A person has 500 fully paid and 1000 half paid shares of a company. The face value of each share is Rs. 10. The company declares a dividend of 10%. How much dividend will he get ?

(9 × 1 = 9 weightage)

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

22. Find the equation of a straight line passing through (2, 5) and perpendicular to the straight line  $5x - 2y + 8 = 0$ . Also find the slope and y intercept.
23. Find the total derivative of  $u$  with respect to  $t$ , where  $u = x^3 + y^3$  and  $x = e^t \cos t$ ,  $y = \sin t$ .

24. Find the adjoint of the matrix  $\begin{pmatrix} 3 & 1 & -1 \\ 1 & 4 & 2 \\ 2 & 3 & 1 \end{pmatrix}$ .

25. The perimeter of a rectangle is 80 cm. For what dimensions, it has the maximum area ?
26. Distinguish between Present value and future value.
27. Using an example to show that matrix multiplication is not commutative.
28. Explain convexity and concavity of functions with illustrative examples.

(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 Cramer's rule.

$$5x - 2y + 3z = 10 ; 2x - 4y + z = 7 ; -x + 2y + 4z = 1.$$

30. Sketch the graphs of following :

(i)  $f(x) = \sin x$  ; (ii)  $f(x) = x^2$ . Also write down the range in each case.

31. Find the maxima and minima of the function  $f(x, y) = x^2 + y^2 - xy - x + y$ .

(2 × 4 = 8 weightage)