

D 51555

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Name.....

Reg. No.....

**THIRD SEMESTER B.A. DEGREE EXAMINATION, NOVEMBER 2013**

(UG-CCSS)

Economics—Core Course

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

(Common for Economics with specialisation Development Economics and Foreign Trade)

Time : Three Hours

Maximum : 30 Weightage

Answers may be written either in English or in Malayalam.

**Part A**

Answer all questions.

Each question carries  $\frac{1}{4}$  weightage.

1. The sum of  $1 + 2 + 3 + \dots + 50$  is :

(a)  $\frac{50 \times (51)}{2}$ .

(b)  $\frac{50 \times (49)}{2}$ .

(c)  $\frac{50 \times (99)}{2}$ .

2. When  $\log_{10} x = 2$  the value of  $x$  is :

(a) 100.

(b)  $100^{0.1}$ .

(c)  $1/100$ .

3. When the demand for a good is given by  $q - 50 = -0.25p$  the maximum price,  $p$  that would be related to nil quantity,  $q$  is :

(a) 25.

(b) 50.

(c) 200.

4. The value of  $\begin{vmatrix} 1 & 3 \\ 2 & 4 \end{vmatrix}$  is :

(a) 0.

(b) -2.

(c) 2.

5. When  $2^x = 16$  the value of  $x$  is :

(a) 4.

(b) -4.

(c) 1.

6. The function  $y = f(x)$  is inflexional if :

(a)  $\frac{d^2x}{dy^2} = 0$ .

(b)  $\frac{d^2y}{dx^2} = 0$ .

(c)  $\frac{d^2y}{dx^2} > 0$ .

7. Matrix A is said to be skew-symmetric matrix when :

(a)  $A = A^{-1}$ .

(b)  $A = A^2$ .

(c)  $A = -A'$ .

8. The slope of the equation  $0.5y = x$  is :

(a) 1.

(b) -1.

(c) 2.

Turn over

9. When  $A \cup B = \{0\}$  the sets A and B are :
- (a) Null. (b) Singleton. (c) Equivalent.
10.  $\frac{d}{dx}(-x)$  is :
- (a) 1. (b) -1. (c) x.
11. When an amount  $y$  grows to  $x$  in  $n$  years at  $r$  per cent interest the relationship among  $y$  and other variables is given by :
- (a)  $y = x(1 - r^n)$ . (b)  $x = y(1 + r)^n$ . (c)  $y = x(1 + r)^{-n}$ .
12. Given  $zx = y$  the partial derivative,  $\frac{\partial z}{\partial x}$  is :
- (a)  $\frac{y}{x}$ . (b)  $\frac{y}{x^2}$ . (c)  $-\frac{y}{x^2}$ .
- (12  $\times$   $\frac{1}{4}$  = 3 weightage)

### Part B (Short Answer Type Questions)

Answer all questions.

Each question carries 1 weightage.

13. Find the value of  $\frac{1}{8} + 2^{-2}$ .
14. Find the root(s) of the equation  $\sqrt{x} - 5 = 0$ .
15. Given  $A = \{1, 2\}$  and  $B = \{2, 3\}$  find  $(A \cup B)$  and  $(A \cap B)$ .
16. Are the following lines parallel?  $y = 2x - 1$  and  $2y = -4x + 5$ . Why?
17. Explain with example : (i) Universal set ; (ii) Finite set.
18. Find  $|AB|$  given  $A = \begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$  and  $B = \begin{bmatrix} 0 & 2 \\ 2 & 0 \end{bmatrix}$ .
19. Find the derivative  $\frac{dx}{dy}$  of  $xy = k$ , where  $k$  is a constant.
20. Find  $\frac{d^2}{dx^2}(-e^{-x} + ex - e)$ .
21. Define present value of a future sum.
- (9  $\times$  1 = 9 weightage)

**Part C (Short Essay/Paragraph Type Questions)**

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

22. Define continuity of a function. Is the function  $y = \frac{x^2 + 4}{x + 2}$  continuous at  $x = -2$ ? Why?
23. Given the function  $y = f(x)$  state the condition for the function to attain a minimum value.
24. Find the stationary values of  $y = (1 + x - x^2)$ .
25. Given  $\frac{dy}{dx} = x^3 - x^2 + 2$ , find  $x$  that makes the function inflexional.
26. Find the present value of a sum of Rs. 10 in 10 years when the rate of discount is 10 percent.
27. Distinguish between simple and compound interest.
28. Define convexity of function  $x = f(y)$ .

(5 × 2 = 10 weightage)

**Part D (Essay Questions)**

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

29. The relationship among three goods is expressed through their prices. Find the equilibrium prices using Cramer's rule :
- $$\begin{aligned} P_1 + 2P_2 + 3P_3 &= 14 \\ 2P_1 + P_2 + P_3 &= 71 \\ 3P_1 + 3P_2 + 2P_3 &= 15 \end{aligned}$$
30. Given  $u = y \log x$ , evaluate the second order partial derivatives.
31. State and explain any four properties of determinant of a matrix.

(2 × 4 = 8 weightage)