

THIRD SEMESTER B.A. DEGREE EXAMINATION, NOVEMBER 2014

(U.G.—CCSS)

Core Course—Economics

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

(2009—2012 Admissions)

Time : Three Hours

Maximum : 30 Weightage

Answer may be written either in English or in Malayalam.

Part A

Answer all questions

- When $x^{-3} = \frac{1}{27}$ the value of x is:
 - 3
 - 3
 - $\frac{1}{3}$
- $(\log x)^2 = ?$
 - $\log x + \log x$
 - $\log x \times \log x$
 - $\log(x + x)$
- The sum of $1 + 2 + 3 + \dots + n$ is
 - $\frac{n^2 + n}{2}$
 - $\frac{n(n-1)}{2}$
 - $\frac{n(n^2 - 1)}{2}$
- When the demand the supply functions are respectively $-10 + p$ and $50 - 9p$ the equilibrium price is:
 - 6
 - 2
 - 1
- The determinant of matrix $A = \begin{bmatrix} -1 & -3 \\ 2 & 6 \end{bmatrix}$ is:
 - 7
 - 0
 - 10
- If $A = \begin{bmatrix} 5 & 12 \\ 2 & -1 \end{bmatrix}$, then $2A$ is:
 - $\begin{bmatrix} 10 & 24 \\ 4 & -2 \end{bmatrix}$
 - $\begin{bmatrix} 5 & 4 \\ 4 & 5 \end{bmatrix}$
 - $\begin{bmatrix} 5 & -4 \\ -4 & 5 \end{bmatrix}$

Turn over

7. The slope of the function $3y = -2x$ is:
 a) -2 b) $-2/3$ c) $1/3$
8. $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x - 3}$ is:
 a) 9 b) 3 c) 6
9. $\frac{d^2 \log_e x}{dx^2}$ is:
 a) $-\frac{1}{x}$ b) $-\frac{1}{x^2}$ c) $\frac{1}{x^2}$
10. The maximum value of the function $y = x - x^2$ occurs when x is:
 a) $-\frac{1}{2}$ b) $\frac{1}{2}$ c) 2
11. Given $z = xy$ the second order cross derivative, $\frac{\partial^2 z}{\partial x \partial y}$ is:
 a) y b) x c) 1
12. When the growth function is given by $A = P[1 + r]^n$, the growth rate, r is given by:
 a) $\left[\frac{A}{P} - 1\right]^{1/n}$ b) $\left[\frac{A}{P}\right]^{1/n} - 1$ c) $[A - P]^{1/n}$
 ($12 \times \frac{1}{4} = 3$ Weightage)

Part B (Short Answer type Questions)

Answer all questions

13. Find the value of $27^{-1/3} - 27^{-2/3}$.
14. Find the roots of the equation $3x^2 - \frac{25}{3} = 0$.
15. Given $A = \{a, b, c, d, e\}$ and $B = \{1, 2\}$ find $(A \cup B) \cup (A \cap B)$.
16. Distinguish between equal sets and equivalent sets.
17. Evaluate the determinant of $A = \begin{vmatrix} 2 & 10 & 8 \\ 3 & 15 & 220 \\ 4 & 20 & 180 \end{vmatrix}$ using the property of determinants

18. Find AA' when $A = \begin{bmatrix} 2 & 4 \\ 1 & 3 \end{bmatrix}$

19. Given $A = \begin{bmatrix} 2 & 0 \\ -3 & -2 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & -3 \\ 0 & 2 \end{bmatrix}$ find $A+B$.

20. Find $\frac{d^2}{dx^2} \left(\frac{1}{x} - x + 2 - e^{-x} \right)$

21. Given the consumption function $C = 2000 + 0.75Y$, find the saving function, S when $Y = C + S$.

(9 × 1 = 9 weightage)

Part C (Short Essay/Paragraph type Questions)

Answer any five questions out of seven.

22. Is the function $f(x) = \frac{x^3 - 27}{x^2 - 9}$ continuous at $x=3$? Why?

23. Find $\frac{d^2}{dx^2} e^{-x^2}$

24. Find the extreme values of $y = x + \frac{1}{x}$.

25. Given $y = x^3 - 2x + 1$ for what values of x the function is concave from below?

26. Find the rate of interest if a sum grows to 1000 in 2 years if the initial amount is 500.

27. Solve $(x^2 - 1)(x - 3) = 0$

28. Find the slope of the curve $y = \log(1-x)$ at $x = 2$

(5 × 2 = 10 Weightage)

Part D Essay Questions

Answer any two questions out of three

29. Solve the equation using Cramer's rule

$$x + 2y + 3z = 14$$

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30. Given $u = 3x^2 + 5y^3 - 8z - 2$ evaluate all the second order partial derivatives.

31. Explain the various methods of computing growth rate of a variable with suitable example from economics.

(2 × 4 = 8 Weightage)