Reg. No. : ....

Name : ....

I Semester B.A. Degree (CBCSS – Reg./Supple./Improv.) Examination, November 2018
Complementary Course in Economics
1C01ECO – MATHEMATICS FOR ECONOMIC ANALYSIS – I
(2014 Admn. Onwards)

Time : 3 Hours

Max. Marks : 40

PART – A

Answer **all** questions. **Each** question carries **one** mark.

1. What is graph of function ?

2. What are cost curves ?

3. What is Derivative ?

4. Define Linear function.

(1×4=4)

PART – B

Answer **any seven** questions. **Each** question carries **2** marks.

5. Evaluate $\lim\limits_{x \to a} \dfrac{\sqrt{x}+\sqrt{a}}{x+a}$.

6. Show that f(x) is continuous at x = 1, if $f(x) = \dfrac{x^2-1}{x-1}$ for $x \neq 1$; f(x) = 2 for x = 1.

7. Distinguish between single valued and multivalued functions.

8. What is partial derivative ?

9. Distinguish between utility function and consumption function.

10. Distinguish between point continuity and interval continuity.

11. Distinguish between increasing function and decreasing function.

12. For the function $z = ax^2 + 2hxy + by^2$ find $\dfrac{\partial z}{\partial x} \cdot \dfrac{\partial z}{\partial y}$.

P.T.O.

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13. Differentiate $\dfrac{x^3 + 2x - 7}{x + 5}$.

14. Explain L'Hospital's rule.

$(2 \times 7 = 14)$

PART – C

Answer **any four** questions. **Each** question carries **3** marks.

15. Explain the Rules of Differentiation.

16. Verify Euler's Theorem for $z = x^4 + y^4$.

17. The demand law for chocolate is $p = 15 - \dfrac{1}{5}x$. Find the marginal revenue function. Represent it graphically. When is MR zero ?

18. If $x^3 + y^3 = 3axy$, find $\dfrac{dy}{dx}$.

19. Discuss the continuity at $x = 0$, $x = 1$

If $f(x) = -x^2$ for $x \leq 0$, $f(x) = 5x - 4$ for $0 < x < 1$, $f(x) = 4x^2 - 3x$ for $1 \leq x \leq 2$.

20. Show that the Cobb-Douglas production function $Q = AL^\alpha K^\beta$ a homogeneous function of degree 1.

$(3 \times 4 = 12)$

PART – D

Answer **any two** questions. **Each** question carries **5** marks.

21. Explain the application of derivatives in Economics.

22. Explain Constrained Optimization. Maximize utility function $U = 4xy - y^2$ subject to a constraint $2x + y - 6 = 0$.

23. What are maxima and minima functions ? What are the conditions for maxima and minima functions ? Determine the maxima and minima values of $1/3\ x^3 - 2x^2 + 3x + 1$.

24. Explain the price elasticity of demand and supply. If $R = pq$ show that $dR/dq = P\left(1 - \dfrac{1}{\eta}\right)$, where η is the elasticity of demand.

$(5 \times 2 = 10)$