



K17U 1895

Reg. No. :

Name :

III Semester B.A. Degree (CBCSS – Reg./Sup./Imp.)

Examination, November 2017

(2014 Admn. Onwards)

COMPLEMENTARY COURSE IN ECONOMICS

3C03 ECO : MATHEMATICAL ECONOMICS – I

Time : 3 Hours

Max. Marks : 40

PART – A

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

1. If $TR = 10x$ and $TC = 5x + 2$, then profit function is _____
2. If cost function is $C(x) = x^2 + 2x$, then MC is _____
3. What is indifference curve ?
4. Define production function.

(4×1=4)

PART – B

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

5. List $x = A \cdot L^\alpha K^\beta$ be the production function of the firm.
 - a) Find average product of labour. Under what condition will it be diminishing ?
 - b) Show that the ratio of MP_L to AP_L is constant.
6. If marginal revenue is 25 and the elasticity of demand with respect to price is 2, find the average revenue.
7. Under what conditions the indifference map of the utility function, $U = (x + 2)(y + 1)$, would be well-behaved ?

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8. Explain the derivation of demand curves ?
9. If $p = f(x)$ is a downward sloping demand curve with $f(x)$ concave, show that marginal revenue curve must also be downward sloping.
10. Distinguish Cobb-Douglas and CES production function.
11. The total cost of the firm under perfect competition is given by $C = x^3 - 6x^2 + 15x + 10$. Find the supply function of the firm.

12. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ of the function $y = \frac{10}{(x+1)^2}$ and represent its behavior by drawing its sketch.

13. Distinguish between monopoly and monopsony.
14. Examine homogenous and homothetic utility function. (7×2=14)

PART – C

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

15. Explain mathematically the elasticity of substitution.
16. Explain price discrimination under monopoly.
17. Distinguish between indifference curves and isoquants. Mathematically explain the properties of indifference curve.
18. Explain the demand and supply functions under perfect competition.
19. Explain the revealed preference theorem.
20. The total cost of the firm is given by $0.01x^3 - 2x^2 + 400x$, find :
 - a) The MC function
 - b) Slope of MC curve
 - c) The AC function
 - d) The value of x at which $MC = AC$.



21. If the marginal revenue of the monopolist is Rs. 30 and price elasticity of demand is 1.5, find price.

22. Explain marginal utility, marginal product and marginal cost. (4x3=12)

PART - D

Answer any two questions. Each question carries 5 marks.

23. Explain Slutsky equation.

24. Explain the role of theory and mathematics in economics.

25. Explain elasticity. What are the different types and measurement of elasticity ?

26. Explain the linear expenditure system. (2x5=10)