D 30665 (Pages : 2) Name.....

Reg. No.....

# FIFTH SEMESTER (CBCSS–UG) DEGREE EXAMINATION NOVEMBER 2022

Economics

ECO 5B 10—MATHEMATICAL ECONOMICS

(2019 Admissions onwards)

Time : Two Hours and a Half Maximum : 80 Marks

## Section A (Short Answer Questions)

*Maximum marks in this section is 25.*
*Students can attempt all questions.*
*Each question carries a maximum of 2 marks.*

1. What is the difference between APS and MPS ?
2. Define elasticity of substitution.
3. State linear demand equation mathematically.
4. Briefly explain Euler's theorem.
5. What is meant by Leontief matrix ?
6. Calculate consumption level for Y = Rs. 1,000 crores if consumption function is C = 200 + 0.5Y.
7. Explain producer's equilibrium.
8. Differentiate between homogeneous and non-homogeneous production function.
9. Point out the relationship between AC and MC.
10. Define and state saving function.
11. What is cross elasticity of demand ?
12. Differentiate between price maker and price taker.
13. Find the Average Product for the production function $Q = 20\ K^{0.7}L^{0.1}$.
14. What is a non-negativity constraint in linear programming ?
15. What is a multivariate function ?

## Section B (Short Essay/Paragraph Questions)

*Maximum marks in this section is* 35.
*Students can attempt all questions.*
*Each question carries a maximum of* 5 *marks.*

16. Maximize the utility function $U = 10X^{.6} + Y^{.4}$ subject to the constraint $20X + 30Y = 600$.
17. Prove that MPC + MPS is always equal to one. Explain the method of calculating MPC and MPS using an example.
18. What are the properties of Cobb Douglas production function ?
19. What is input output analysis ? Explain the uses of input output analysis.
20. Differentiate between total utility and marginal utility. Given the utility function $u = xy + 3x + 4y$, find the marginal utility of $x$ and $y$.
21. Examine the meaning and significance of mathematical economics.
22. Differentiate between Marginal Rate of Substitution and Marginal Rate of Technical Substitution. Describe steps of calculating Marginal Rate of Technical Substitution.
23. Explain the meaning and features of perfect competition. State the equilibrium conditions of firm under perfect competition.

## Section C (Long Essay Questions)

*Answer any* **two** *questions.*
*Each question carries a maximum of* 10 *marks.*

24. Explain the features of monopoly market. What are the different types of discriminating monopoly ? State the conditions of equilibrium under discriminating monopoly.
25. Explain degrees of elasticity. Differentiate between price elasticity, income elasticity and cross elasticity. Find the price elasticity of demand for the demand function $Q=1400 - P^2$ when $P = 10$.
26. Explain the fundamental assumptions of Linear Programming. Solve using the graphical method the following problem :

Maximize $Z = 3x + 2y$
subject to : $2x + y \leq 18$
$2x + 3y \leq 42$
$3x + y \leq 24$
$x \geq 0, y \geq 0$.

27. Explain the meaning and significance of Lagrange multipliers. Examine the economic applications of optimization technique

(2 × 10 = 20 marks)