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Name.....

Reg. No.....

FIFTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION NOVEMBER 2024

Economics

ECO 5B 10—MATHEMATICAL ECONOMICS

(2019 Admission onwards)

ıe : 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 $MRTS_{LK}$?
2. Define production function.
3. What do you mean by factor intensity ?
4. Define economic model.
5. Distinguish between primal and dual problem in linear programming.
6. Point out relationship between AC and MC.
7. Define market equilibrium.
8. Differentiate between autonomous and induced consumption.
9. What is optimal solution ?
10. Given a consumption function, C = 100 + 0.5 Y, find MPC and MPS.
11. Define feasible solution.
12. Find the Average Product for the production function $Q = 40\ K^{0.7}L^{0.1}$.
13. What is meant by input output table ?
14. Determine the shapes of AR and MR curves under monopoly
15. What are Giffen goods and their elasticity ?

Turn over

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. What do you mean by Marginal Rate of Substitution ? Find MRSxy for the function $U = 12x + y$.

17. Define discriminating monopoly. What are the necessary conditions for price discrimination?

18. Distinguish between AR and MR. Illustrate the relationship between AR and MR with the help of a diagram

19. Define perfect competition. Assume that a perfectly competitive market faces P = Rs. 4 and $TC = X^3 - 7X^2 + 12X + 5$. Find the best level of output of the firm. Also find the profit of the firm at this level of output.

20. Maximize $Z = 3x_1 + 4x_2$
Subject to the constraints
$4x_1 + 2x_2 \leq 80$
$2x_1 + 5x_2 \leq 180$
$x_1, x_2 \geq 0$

21. Explain the meaning and applications of Lagrange multipliers.

22. Illustrate the input output matrix of technical co-efficients in $X = (I - A)^{-1} B$ format.

23. Explain the meaning and significance of production possibility curve.

Section C (Long Essay Questions)

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

24. Differentiate between optimization of single variable function and multivariable function. Describe the problem of constrained minimization of cost, $C = wL + rK$.

25. Discuss meaning and significance of Mathematical Economics. Derive the mathematical applications in economics using examples of Utility function and Profit function.

. Explain linear homogeneous production function. State and prove any *four* properties of Cob Douglas production function

. Explain various degrees of price elasticity of demand.

Given $Q1 = 100 - P1 + 0.75P2 - 0.25P3 + 0.0075Y$

At $P1 = 10$, $P2 = 20$, $P3 = 40$ and $Y = 10{,}000$, find the different cross elasticities of demand.

(2 × 10 = 20 marks)