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Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, MAY 2020

Fourth Semester

Faculty of Science

Branch I-(A)—Mathematics

MT04 E05—MATHEMATICAL ECONOMICS

(2012 Admission onwards)

Time : Three Hours

Maximum Weight : 30

Part A

*Answer any **five** questions.*

Each question has weight 1.

1. What are the assumptions in Indifference Curve Analysis ?
2. State the Consumers Equilibrium Equation for Utility Maximisation.
3. Explain the meaning of the production function with an example.
4. State the limitations of input-output analysis.
5. What are Ridge Lines ? Explain in detail.
6. Differentiate between Static and Dynamic models of input-output analysis.
7. Give examples for linear and non-linear difference equations. Explain the difference.
8. Explain the stability of solutions of difference equations.

(5 × 1 = 5)

Part B

*Answer any **five** questions.*

Each question has weight 2.

9. Explain the equilibrium of the consumer in terms of the utility analysis.
10. Describe the Lagrange's multiplier method to maximise the utility function subject to the budget constraint.

Turn over





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11. Differentiate between Average Productivity Curve and Marginal Productivity Curve.
12. Explain the three stages of the Law of Variable Proportions.
13. Explain interlink between Ridge Lines and Economic Region with diagram.
14. Find out the output on the basis of the Input Multiplier (A) and Final Demand (F) given by :

$$A = \begin{bmatrix} 0.3 & 0.5 & 0.2 \\ 0.2 & 0 & 0.3 \\ 0.1 & 0.3 & 0.3 \end{bmatrix} \text{ and } F = \begin{bmatrix} 100 \\ 40 \\ 50 \end{bmatrix}.$$

15. Solve the difference equation :

$$8y_{x+1} + 4y_x - 3 = 0, y_0 = \frac{1}{2}.$$

Also discuss the behaviour of the solution.

16. Discuss the application of Linear Difference Equation in consumption model.

(5 × 2 = 10)

Part C

Answer any **three** questions.

Each question has weight 5.

17. (a) If all prices and income change in the same proportion then the quantity demanded is same.— Prove.
(b) Explain the theory of Consumer Behaviour briefly.
18. (a) For the Cobb Douglas Production function, what do α and β represent ? Prove your statement.
(b) What is Producer's Equilibrium ? Establish the conditions to obtain it.
19. (a) State and prove Euler's theorem.
(b) Write a note on the slope of production function and give reasons for the same.
(c) If the profit ratio remains unaltered, the ratio of amount of capital employed per unit labour shifts from 10 : 10 to 12 : 11, given that the rise in wages is 25 %. Determine the Elasticity of Substitution.





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20. For the economy represented in the following table and the predicted future final demand, set up the system of equations and solve for the new total outputs and new labour requirements :—

		<i>Ind P</i>	<i>Ind Q</i>	<i>Final Dem.</i>	<i>Total output</i>
<i>Ind P</i>	...	40	20	40	100
<i>Ind Q</i>	...	20	160	20	200
<i>Labour</i>	...	40	20		

Predicted demand for 5 years in future : 45 for P, 30 for Q.

21. (a) Examine the role of difference equation in Income-Consumption-Investment model.
(b) Discuss the General Cobweb Model.

(3 × 5 = 15)

