SECOND SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2023

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U MEC2 C02 - MATHEMATICAL ECONOMICS

(Statistics - Complementary Course)

(2019 Admission onwards)

Time : 2.00 Hours   Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

Answer *all* questions. Each question carries 2 marks.

1. How can you define Lorenz curve?

2. What is gradient vector?

3. Define second order partial derivatives. Also mention its uses.

4. Explain local minima and local maxima

5. What is global minima and global maxima.

6. State the Profit Maximization problem of a competetive Firm.

7. What is inequality constraints?

8. What is mixed constraints?

9. Give an example of constrained minimization problem.

10. Mention the Khun-Tucker Lagrangian for the Utility Maximization problem.

11. What do you say about the coefficient matrix of a closed model in input-output Analysis?

12. Mention any three limitations of input-output analysis.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer *all* questions. Each question carries 5 marks.

13. Explain various causes of income inequality

14. Find Gini ratio of the series 460, 343, 406, 501, 1662.

15. Find the cross partial derivative of the function $f(x, y) = 5x^2 - 1.5y^2 - 30x - 4y + 5xy$.

16. Discuss least square analysis

17. Discuss about two variables with one equality constraint.

18. Verify Hawkins-simon condition for the matrix $A = \begin{bmatrix} 0 & 3/10 & 3/5 \\ 1/5 & 1/10 & 3/5 \\ 1/5 & 3/10 & 2/5 \end{bmatrix}$

19. Explain the leontief production function.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. Explain Leontief input-output model. For a three sector economy the usage, final demand and output corresponding to each sector (in value) is given below:

	D1	D2	D3	Final Demand	Total
D1	8	10	10	40	320
D2	8	20	60	60	400
D3	8	10	10	20	300

Assuming the technical matrix remain the same, find the output if the final demand vector changes to
$F = \begin{bmatrix} 10 \\ 40 \\ 20 \end{bmatrix}$.

21. Explain the technological coefficient matrix. Find the labour requirements if the matrix is given by

	A	B	C	Final Demand
A	0.1	0.2	0.4	40
B	0.3	0.2	0.1	50
C	0.2	0.4	0.3	80
Labour	0.2	0.3	0.2	

(1 × 10 = 10 Marks)

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