

Exam Code: 509602

Paper Code: 2268

Programme: Master of Science (Economics) Semester –II

Course Title: Mathematical Techniques

Course Code: MECL-2171 ✓

Time Allowed: 3 Hours

Max. Marks: 70

Note: Candidates are required to attempt five questions, selecting atleast one question from each section. The fifth question may be attempted from any section. Each question carries 14 marks.

Section A

1. Prove that $u = \log_e\left(\frac{x^2+y^2}{xy}\right)$ is a homogenous function of degree zero. (14)
2. If $P = \frac{121}{q+4} - 1$, find output level at which total revenue is maximum, also find maximum revenue. (14)

Section B

3. (a) Integrate:

$$\int \frac{x}{(x-1)(2x+1)} dx \quad (7)$$

$$(b) \text{ Solve } y_{x+2} - 2y_{x+1} + 2y_x = 0 \quad (7)$$

4. The demand and supply function under pure competition are $p=1600-x^2$ and $p=2x^2+400$ respectively. Find the consumer's surplus and producer's Surplus. (14)

Section C

5. Determine the characteristic roots and characteristic vectors of the matrix:-

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & -4 & 2 \\ 0 & 0 & 7 \end{bmatrix}$$

6. Solve following equations by Matrix inverse method

$$x_1 - x_2 + x_3 = 4 \quad ; \quad 2x_1 + x_2 - 3x_3 = 0 \quad ; \quad x_1 + x_2 + x_3 = 2 \quad (14)$$

Section D

7. Solve the LPP by Simplex method

$$\text{Maximize } Z = 5x_1 + 3x_2$$

Subject to constraints

$$5x_1 + 2x_2 \leq 10$$

$$-3x_1 - 8x_2 \leq -12$$

$$x_1, x_2 \geq 0 \quad (14)$$

8. (a) Solve the following LPP by graphic method.

$$\text{Min } Z = 2x_1 + 3x_2$$

Subject to constraints

$$x_1 + x_2 \geq 8$$

$$3x_1 + 5x_2 \geq 30$$

$$2x_1 + x_2 \geq 12$$

$$x_1, x_2 \geq 0 \quad (10)$$

(b) Define duality. What are the steps to convert primal problem into dual problem. (4)

Exam Code: 509602

Paper Code: 2269

Programme: Master of Science (Economics) Semester-II

Course Title: Research Methodology

Course Code: MECL-2172

Time Allowed: 3 Hours

Max. Marks: 70

Note: Candidates are required to attempt five questions, selecting atleast one question from each of the four sections. The fifth question may be attempted from any section. Each question carries 14 marks.

Section-A

- Q1) Discuss the steps involved in the research process.
- Q2) Explain the process of formulating a research problem and selecting its objectives.

Section-B

- Q3) Describe the scope and significance of the literature review.
- Q4) Define plagiarism. How can we avoid it?

Section-C

- Q5) Discuss the various types of variables from the point of view of research design.
- Q6) Explain the steps involved in hypothesis testing.

Section-D

- Q7) Elaborate on the principles and codes of ethical acceptable research.
- Q8) Describe the steps involved in writing a final research report.

Exam Code: 509602

Paper Code: 2270

Programme: Master of Science (Economics)

Semester: II

Course Title: Econometrics Techniques

Course Code: MECL-2173

Time Allowed: 3 Hours

Maximum Marks: 70

NOTE: Candidates are required to attempt five questions, selecting at least one from each section. The fifth question may be attempted from any section. Each question carries 14 marks. Students can use non-scientific calculator and statistical tables.

Section A

1. What do you mean by coefficient of determination? Derive its value and also give its interpretation. 14
2. Explain the factors responsible for the problem of multicollinearity. Also explain the measures to detect it. 14

Section B

3. What are dummy variable? Explain various applications of dummy variables. 14
4. Briefly explain dummy dependent model. Discuss the working of Logit model in detail 14

Section C

5. What do you mean by cointegration? Explain procedure to detect its presence. 14
6. What do you mean by Causality? Explain the procedure of causality suggested by Granger. 14

Section D

7. What are simultaneous equation model? Explain indirect least square method of estimating it. 14
8. What do you mean by Panel data? Explain with the help of example LSDV model when intercept is variable over space and time. 14

Exam Code: 509602

Paper Code: 2271

Programme: Master of Science (Economics) Semester - II

Course Title: Rural Economics

Course Code: MECL-2174 (OPT - II)

Time Allowed: 3 Hours

Max. Marks: 70

NOTE: Candidates are required to attempt five questions, selecting at least one from each section. The fifth question may be attempted from any section. Each question carries 14 marks.

Section - A

- Q1. Briefly discuss the main theories of agriculture-industry interaction and their relevance to economic development.
- Q2. What were the main objectives and components of land reforms in India? Evaluate their impact on the rural economy.

Section - B

- Q3. Examine the extent, causes, and estimates of rural poverty in India. What policy measures have been taken to reduce it?
- Q4. Critically examine the impact of the Green Revolution on agricultural production in India.

Section - C

- Q5. Compare co-operative marketing and contract farming in rural India. Which is more sustainable for farmers in the long term, and why?
- Q6. Discuss agricultural price behaviour in India. What is the cobweb theory, and how is it relevant to price instability in agriculture?

Section - D

- Q7. What is rural industrialisation? Briefly explain its importance and the role of mini-industrial estates and industrial cooperatives in promoting it.
- Q8. Evaluate the impact of poverty alleviation programmes on improving rural livelihoods in India. What challenges remain in their implementation?

Exam Code: 509602

Paper Code: 2272

Programme: Master of Science (Economics) Semester - II

Course Title: Economics of Environment

Course Title: MECL-2175 (OPT- III)

Time Allowed: 3 Hours

Max. Marks: 70

NOTE: Candidates are required to attempt five questions in all, selecting at least one from each section. The fifth question may be attempted from any section. Each question carries 14 marks.

SECTION A

1. What are the key differences between Environmental Economics and Ecological Economics? Explain how they address the relationship between economic activities and environmental sustainability.
2. What are environmental externalities? Explain with suitable examples how taxes and subsidies can be used to correct negative externalities.

SECTION B

3. Explain the concept of the environmental and development trade-off. How does this trade-off challenge the goals of sustainable development? Discuss the importance of balancing environmental concerns with economic growth.
4. What is integrated environmental and economic accounting? Why is it important for measuring a country's sustainability?

SECTION C

5. Explain the concept of benefit-cost analysis. How is it used to measure the benefits and costs of environmental protection?
6. Discuss the various types of environmental regulations and legislations that address air, water, and land pollution. How do these laws protect natural resources?

SECTION D

7. What are Rio Convention and the Bali Action Plan? How they are important for sustainable development?
8. Explain the mechanisms for environmental regulation in India. Discuss various policy initiatives taken in India to control pollution.