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| **University of Kerala** | | |
| Discipline: **Mathematics** |  | Time: 2 Hours (120 Mins.) |
| Course Code: **UK1DSCMAT109** |  | Total Marks: 56 |
| Course Title: Mathematics for Social Science I |  |  |
| Type of Course: DSC |  |  |
| Semester: 1 |  |  |
| Academic Level: 100-199 |  |  |
| Total Credit: 4, Theory: 4 Credit, Practical: 0 Credit |  |  |

**Part A. 6 Marks**. Time: 5 Minutes

Objective Type. 1 Mark Each. Answer All Questions

(Cognitive Level: Remember/Understand)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 1. | Define a set with suitable example. | Remember | CO1 |
| 2. | Define: Linear Equation | Remember | CO 2 |
| 3. | Solve: | Understand | CO 2 |
| 4. | Say True or False. The sets A={x/ x is a letter of the word “follow”} and B={x/ x is a letter of the word “flow”} are equivalent. | Understand | CO 1 |
| 5. | Define ‘Basic Solution’ in Linear Programming Problem. | Remember | CO 3 |
| 6. | If A={0,1} and B={-3,-2} find the Cartesian Product AB | Remember | CO 1 |

**Part B. 10 Marks**. Time: 20 Minutes

Two-Three sentences. 2 Marks Each. Answer All Questions

(Cognitive Level: Remember/Understand/Apply)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 7. | Show that and  are disjoint sets. | Remember | CO 1 |
| 8. | Draw the graph of demand curves for p=15-x. | Remember | CO 4 |
| 9. | Let , find the relation on defined by if . | Remember | CO 1 |
| 10. | Solve | Understand | CO 2 |
| 11. | Explain the feasible solution of an LPP with the help of an example. | Apply | CO 3 |

**Part C. 16 Marks**.

Time: 35 Minutes

Short Answer. 4 Marks Each. Answer all 4 questions, choosing among options within each question.

(Cognitive Level: Remember/Understand/Apply/Analyse)

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| Qn.  No. | Question | Cognitive  Level | Course  Outcome (CO) |
| 12. | A. What are the basic assumptions of a Linear Programming Problem?  OR  B. Describe the General Linear programming Problem | Understand | CO 3 |
| 13. | A. Solve the linear equation:  OR  B. Solve: ; | Understand | CO 2 |
| 14. | A. Draw the graph of  Or  B. Draw the total revenue curve ; | Analyze | CO 4 |
| 15. | A. State De Morgan’s laws. Verify them for  P={1, 2, 3, 4, 5}, Q={3, 4, 6, 7} and Set of Natural numbers.  Or  B. Let A={1, 2, 3, 4, 5}, B={3, 4, 5, 6, 7}, C={0, 1, 8, 9} and Set of Natural numbers. Find  a)  b)  c)  d) | Apply | CO 1 |

**Part D. 24 Marks**.

Time: 60 Minutes

Long Answer. 6 Marks Each. Answer all 4 questions, **choosing among options within each question**. (Cognitive Level: Understand/Apply/Analyse/Evaluate/Create)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 16. | A.  If A= {1,2,3,4,5}, B= {3,4,5,6,7} and C= {0,1,8,9}. Find and  OR  B.  i) Let A= B ={1,2,3,4} find the relation from A to B defined by if . Also find the Domain and range of this relation.  ii) A function is defined by and the domain of the function is {-2,1,2,3}. Find and also find the range set of the function. | Understand | CO 1 |
| 17. | A.  A market demand curve is given by Find (i)the maximum price anybody will pay for the commodity, (ii) the amount demanded when commodity is a free good.  OR  B.  A unit of commodity A is produced by combining one acre of land and 2 days of labour. A unit of commodity B requires 2 acres of land and 4 days of labour. Given that and , show that it is not possible to determine the rent and the wage . Why? | Understand | CO 2 |
| 18. | A.  Maximise  Subject to    And  OR  B.  Maximise  Subject to      And | Analyse | CO 3 |
| 19. | A. Plot the TC and MC curve of  OR  B. Trace the demand curve, . | Apply | CO 4 |

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| **Cognitive Level** | **Marks** | **Percentage** |  | **Course Outcomes** | **Marks** | **Percentage** |
| Remember | 10 | 17.85 |  | CO1 | 17 | 30 |
| Understand | 24 | 42.87 |  | CO2 | 14 | 25 |
| Apply | 12 | 21.43 |  | CO3 | 13 | 23 |
| Analyse | 10 | 17.85 |  | CO4 | 12 | 22 |
| Evaluate | 0 | 0 |  |  |  |  |
| Create | 0 | 0 |  |  |  |  |
| **TOTAL** | **56** | **100** |  | **TOTAL** | **56** | **100** |