U8436

Reg. No.: .....

Name:.....

University of Kerala

First Semester Degree Examination, November 2024

Four Year Under Graduate Programme

Discipline Specific Core Course

MATHEMATICS

UKIDSCMAT109- MATHEMATICS FOR SOCIAL SCIENCE I

Academic Level: 100-199

Time: 2 Hours Max. Marks: 56

Part A.

Answer All Questions, Objective Type. 1 Mark Each.
(Cognitive Level: Remember/Understand) 6 Marks. Time: 5 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	Express the set of all odd integers in rule method.	Remember	CO1
2.	Define the complement of set A in universal set U	Remember	CO1
3.	Find the value of x in $2x+5=11$	Understand	CO2
4.	Find the solution of $x^2+2x+1=0$	Understand	CO2
5.	Which of the following is an objective function in LLP (a) Maximize profit (b) Minimize cost (c) Both a and b (d) Neither a nor b	Remember	CO3
6.	Which of the following is an example of a decision variable? (a) x (b) 2 (c) 3y (d) Max Z	Remember	CO3

Part B.

Answer All Questions, Two-Three sentences. 2 Marks Each.
(Cognitive Level: Remember/Understand/Apply) 10 Marks. Time: 20 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	Find the power set of A = {1,2,3}	Remember	CO1
8.	Find the cartesian product of AxB and BxA if A={1,2}, B={1,2,3}	Remember	CO1
9.	What do you mean by multiple optimal solution	Remember	CO3
10.	What are decision variables in LPP	Understand	CO3
11.	Solve 13x-4 (5x-8) + 17=0	Apply	CO2

Part C.

Answer all 4 questions, choosing among options within each question.
Short Answer. 4 Marks Each.
(Cognitive Level: Remember/Understand/Apply/Analyse) 16 Marks. Time: 35 Minutes

Qn.No.	Question	Cognitive Level	Course Outcome (CO)
12.	**A.** If A = {a,b,c}, B = {1,2,3} and C = {e,f} Find A-B, B-C and A-C **OR** **B.** A = {a, e, i, o, u, z}, B = {i, u, x, y}. Ω = Set of all lower case alphabets. Find $A \cup B, A \cap B, A^c \cup B^c, A^c \cap B^c$.	Understand	CO1
13.	**A.** Explain feasible and Basic feasible solution of an LPP with a proper example **OR** **B.** Define slack variables. Explain the use of slack variables in an LPP.	Understand	CO3
14.	**A.** Solve x^2-16x+48=0 **OR** **B.** Solve x^2-24x+144=0	Analyze	CO2
15.	**A.** Plot the total revenue function TR=x $(10-2x)^2$ **OR** **B.** What are the key concepts in TR function?	Apply	CO4

Part D.

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

Long Answer. 6 Marks Each.

(Cognitive Level: Remember/Understand/Apply/Analyse) 24 Marks. Time: 60 Minutes

Qn.No.	Question	Cognitive Level	Course Outcome (CO)
16.	A. Let A = {0,1,2,3}. For $x \in A$, $y \in A$, find the relation (i) $y<x$ (ii) $x = y$, (iii) $x = 2y$. Also find the domain and range of each relation. OR B. Let A = {1,2,3}, B = {2,3,4}, C = {5,6,7} and D ={6,7,8}. Verify that $(A \cap B) \times (C \cap D) = (A \times C) \cap (B \times D)$ holds.	Understand	CO1
17.	A. Solve the system of equations; $2.5x + 1.8y = 7.2$ $1.2x - 0.8y = 2.4$ OR B. Solve the system of equations; $14x - 81y = 9$ $91x - 15y = 31$	Understand	CO2
18.	A. Solve the LPP using graphical method: Maximize $z = 2x+5y$ Subject to $x+4y \leq 24$ $3x+y \leq 21$ $x+y \leq 9$ $x,y \geq 0$ OR B. Solve the LPP Maximize $f = 3x_1 + 4x_2$ Subject to $x_1 + x_2 \leq 6;$ $2x_1 + 4x_2 \leq 21$ $x_1 + 4x_2 \leq 6$ $x_1, x_2 \geq 0$	Analyse	CO3
19.	A. Compare the form of demand curves and total revenue curves described from the following case $p=(3-x)$ and $p= (4-x^2)$ OR B. Discuss and trace the demand curves 1. $p= 20-x$ 2. $p=10-x^2$	Apply	CO4