D 10669

(Pages : 4)

Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Mathematics

MTS 5B 08—LINEAR PROGRAMMING

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A

Answer at least **eight** *questions.*
Each question carries 3 marks.
All questions can be attended.
Overall Ceiling 24.

1. Define canonical minimization linear programming problem.
2. Give an example of a bounded polyhedral convex subset in $\mathbb{R}^2$.
3. State the canonical minimization linear programming problem represented by the following tableau :

x	1	2	3
y	4	5	6
-1	7	8	9
	$=t_1$	$=t_2$	g

4. Define unbounded linear programming problem.
5. Pivot on 5 in the canonical maximum tableau given below :

x_1	x_2	-1	
1	2	3	$=-t_1$
4	5	6	$=-t_2$
7	8	9	$=f$

6. Write the simplex algorithm for maximum tableaus.
7. What do you mean by complementary slackness ?
8. State Duality theorem.

Turn over

15. Solve the canonical linear programming problem using simplex algorithm :

x	-2	1	-3
y	1	-2	-2
-1	1	0	0
	$=t_1$	$=t_2$	g

16. Solve the non-canonical linear programming problem given below

Maximize $f(x,y,z) = 2x + y - 2z$ subject to

$x + y + z \leq 1$

$y + 4z = 2$

$x, y, z \geq 0$.

17. Write the dual simplex algorithm for minimum tableaus.

18. Solve the transportation problem given below :

	M_1	M_2	M_3	
W_1	2	1	2	50
W_2	9	4	7	70
W_3	1	2	9	20
	40	50	20	

19. Apply Northwest-corner method to obtain the initial basic feasible solution of the transportation problem given below :

7	2	4	10
10	5	9	20
7	3	5	30
20	10	30	

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. Solve the canonical linear programming problem given below using the simplex algorithm.

x	y	z	-1	
1	2	1	4	$=-t_1$
2	1	5	5	$=-t_2$
3	2	0	6	$=-t_3$
1	2	3	0	$=f$

Turn over

21. Write the Hungarian algorithm. Using this algorithm solve the following assignment prob

2	3	2	4
5	8	4	3
5	9	5	2
7	6	7	4

(1 × 11 = 11