K17U 1829

Reg. No. : .....

Name : .....

V Semester B.A./B.Sc./B.Com./B.B.A./B.B.A.T.T.M./B.B.A.R.T.M./ B.B.M./B.T.T.M./B.C.A./B.S.W./B.A. Afsal-Ul-Ulama Degree (CBCSS – Reg./Sup./Imp.) Examination, November 2017
(2014 Admission Onwards)
OPEN COURSE
5D04 MAT : Linear Programming

Time : 2 Hours Max. Marks : 20

SECTION – A

Answer **all** the questions. **Each** question carries **one** mark.

1. What do you mean by surplus variables in L.P.P. ?
2. What is the number of basic variables of the general transportation problem at any stage of feasible solution ?
3. How do you check from the transportation table that a feasible solution is basic or not ?
4. When do you say that a transportation problem is unbalanced ? **(4×1=4)**

SECTION – B

Answer **any 6** questions. **Each** question carries **two** marks.

5. What is the standard form of L.P.P. ? What are its characteristics ?
6. Define basic solution to a system of equations.
7. Obtain the dual of the following L.P.P.
   Maximize $z = 2x_1 + x_2$ subject to the constraints :
   $x_1 + 5x_2 \leq 10$, $x_1 + 3x_2 \geq 6$, $2x_1 + 2x_2 \leq 8$; $x_2 \geq 0$ and x_1 unrestricted.

P.T.O.

8. Solve graphically the following L.P.P.

   Maximize $z = 4x_1 + 3x_2$ subject to the constraints :

   $2x_1 + x_2 \leq 1000$, $x_1 + x_2 \leq 800$, $x_1 \leq 400$, $x_2 \leq 700$, $x_1 \geq 0$, $x_2 \geq 0$.

9. What is meant by degeneracy in transportation problem ? How do you resolve degeneracy at subsequent iterations ?

10. Obtain an initial basic feasible solution to the following transportation problem using the north-west corner rule.

	D_1	D_2	D_3	D_4	Availability
O_1	5	3	6	2	19
O_2	4	7	9	1	37
O_3	3	4	7	5	34
Demand	16	18	31	25	

11. Given below is an assignment problem. Write it as a transportation problem.

	A_1	A_2	A_3
R_1	1	2	3
R_2	4	5	1
R_3	2	1	4

12. Use Vogel's approximation method to obtain an initial basic feasible solution to the following transportation problem.

	D	E	F	G	Available
A	11	13	17	14	250
B	16	18	14	10	300
C	21	24	13	10	400
Demand	200	225	275	250	

13. Obtain an initial basic feasible solution to the following transportation problem using the Least-Cost method.

	D_1	D_2	D_3	D_4	Capacity
O_1	1	2	3	4	6
O_2	4	3	2	0	8
O_3	0	2	2	1	10
Demand	4	6	8	6	

(6×2=12)

SECTION – C

Answer **any 1** question. It carries **four** marks.

14. Use simplex method to solve the L.P.P.
Maximize $z = 3x_1 + 2x_2$ subject to the constraints :
$x_1 + x_2 \leq 4$, $x_1 - x_2 \leq 2$, $x_1 \geq 0$, $x_2 \geq 0$.

15. Solve the following transformation problem.

	To			
From	A	B	C	Available
I	6	8	4	14
II	4	9	8	12
III	1	2	6	5
Demand	6	10	15	

(1×4=4)