TRANSPORTATION

NORTH WEST CORNER RULE

Q.1)

	W_1	W_2	W_3	W_4	SS
F_1	42	32	50	26	11
F_2	34	36	28	46	13
F_3	64	54	36	82	19
DD	6	10	12	15	

TRANSPORTATION SCHEDULE

FROM	TO	QTY X COST	TOTAL COST
		INITIAL BASIC FEASIBLE SOLUTION	

Q.2)

	P	Q	R	S	SS
A	19	30	50	10	1600
B	70	30	40	40	1200
C	40	8	70	20	1700
DD	1000	1500	800	1200	

TRANSPORTATION SCHEDULE

FROM	TO	QTY X COST	TOTAL COST
		INITIAL BASIC FEASIBLE SOLUTION	

Prof.Shahid Qureshi
(9664847492)

TRANSPORTATION

Q.3)

	D_1	D_2	D_3	D_4	D_5	SS
O_1	2	11	10	3	7	4
O_2	1	4	7	2	1	8
O_3	2	9	4	8	12	9
DD	3	3	4	5	6	

TRANSPORTATION SCHEDULE

FROM	TO	QTY X COST	TOTAL COST
		INITIAL BASIC FEASIBLE SOLUTION	

LEAST COST METHOD (LCM)

Q.4)

	W_1	W_2	W_3	W_4	SS
F_1	42	32	50	26	11
F_2	34	36	28	46	13
F_3	64	54	36	82	19
DD	6	10	12	15	

TRANSPORTATION SCHEDULE

FROM	TO	QTY X COST	TOTAL COST
		INITIAL BASIC FEASIBLE SOLUTION	

Prof.Shahid Qureshi
(9664847492)

TRANSPORTATION

Q.5)

	P	**Q**	**R**	**S**	**SS**
A	19	30	50	10	1600
B	70	30	40	40	1200
C	40	8	70	20	1700
DD	1000	1500	800	1200	

TRANSPORTATION SCHEDULE

FROM	**TO**	**QTY X COST**	**TOTAL COST**
		INITIAL BASIC FEASIBLE SOLUTION	

Q.6)

	D_1	**D_2**	**D_3**	**D_4**	**D_5**	**SS**
O_1	2	11	10	3	7	4
O_2	1	4	7	2	1	8
O_3	2	9	4	8	12	9
DD	3	3	4	5	6	

TRANSPORTATION SCHEDULE

FROM	**TO**	**QTY X COST**	**TOTAL COST**
		INITIAL BASIC FEASIBLE SOLUTION	

Prof.Shahid Qureshi
(9664847492)

TRANSPORTATION

VOGELS APPROXIMATION METHOD (VAM)

Q.7)

	W1	W2	W3	W4	SS	PENALTIES					
C1	42	32	50	26	11						
C2	34	36	28	46	13						
C3	64	54	36	82	19						
DD	6	10	12	15							
PENALTIES											

TRANSPORTATION SCHEDULE

FROM	TO	QTY X COST	TOTAL COST
		INITIAL BASIC FEASIBLE SOLUTION	

Prof.Shahid Qureshi
(9664847492)

TRANSPORTATION

Q.8)

	P	Q	R	S	SS	PENALTIES					
A	19	30	50	10	1600						
B	70	30	40	40	1200						
C	40	80	70	20	1700						
DD	1000	1500	800	1200							

PENALTIES					

TRANSPORTATION SCHEDULE

FROM	TO	QTY X COST	TOTAL COST
		INITIAL BASIC FEASIBLE SOLUTION	

Prof.Shahid Qureshi
(9664847492)

TRANSPORTATION

Q.9)

	C_1	C_2	C_3	DUMMY	SS	PENALTIES				
F_1	7	21	35		5					
F_2	2	4	13		8					
F_3	36	22	3		7					
F_4	28	6	9		5					
DD	5	11	5							
PENALTIES										

TRANSPORTATION SCHEDULE

FROM	TO	QTY X COST	TOTAL COST
		INITIAL BASIC FEASIBLE SOLUTION	

Prof.Shahid Qureshi
(9664847492)

TRANSPORTATION

Q.10)

	D1	D2	D3	D4	D5	SS	PENALTIES						
O1	2	11	10	3	7	4							
O2	1	4	7	2	1	8							
O3	3	9	4	8	12	9							
DD	3	3	4	5	6								
PENALITIES													

TRANSPORTATION SCHEDULE

FROM	TO	QTY X COST	TOTAL COST
		INITIAL BASIC FEASIBLE SOLUTION	

Prof.Shahid Qureshi
(9664847492)

TRANSPORTATION

Q.11) A company has a factories at F1, F2 and F3 which supply warehouses at W1, W2, W3 and W4 weekly. Factories capacity are 100, 125 and 75 units. Weekly warehouse requirements are 70, 90, 80 and 60 units respectively. Unit shipping cost (in rupees) are as follows:

FACTORY	**WAREHOUSE**				
	W_1	**W_2**	**W_3**	**W_4**	**SUPPLY**
F_1	6	5	1	3	100
F_2	4	8	7	2	125
F_3	6	3	9	5	75
DEMAND	70	90	80	60	

Determine the optimum distribution for the company to minimize the shipping cost. Use NWCR to obtain Initial Solution.

Solution:

	W_1	**W_2**	**W_3**	**W_4**	**SS**
F_1	6	5	1	3	100
F_2	4	8	7	2	125
F_3	6	3	9	5	75
DD	70	90	80	60	

IBFS=_____
_____

RIM CONDITION = _____
_____

TEST OF OPTIMALITY

	W_1	**W_2**	**W_3**	**W_4**	**U_i**
F_1	6	5	1	3	U_1 =
F_2	4	8	7	2	U_2 =
F_3	6	3	9	5	U_3 =
V_i	V_1 =	V_2 =	V_3 =	V_4 =	

Prof.Shahid Qureshi
(9664847492)

TRANSPORTATION

	W_1	W_2	W_3	W_4	U_i
F_1	6	5	1	3	U_1 =
F_2	4	8	7	2	U_2 =
F_3	6	3	9	5	U_3 =
V_i	V_1 =	V_2 =	V_3 =	V_4 =	

	W_1	W_2	W_3	W_4	U_i
F_1	6	5	1	3	U_1 =
F_2	4	8	7	2	U_2 =
F_3	6	3	9	5	U_3 =
V_i	V_1 =	V_2 =	V_3 =	V_4 =	

	W_1	W_2	W_3	W_4	U_i
F_1	6	5	1	3	U_1 =
F_2	4	8	7	2	U_2 =
F_3	6	3	9	5	U_3 =
V_i	V_1 =	V_2 =	V_3 =	V_4 =	

Prof.Shahid Qureshi
(9664847492)

TRANSPORTATION

	W_1	W_2	W_3	W_4	U_i
F_1	6	5	1	3	U_1 =
F_2	4	8	7	2	U_2 =
F_3	6	3	9	5	U_3 =
V_i	V_1 =	V_2 =	V_3 =	V_4 =	

TRANSPORTATION SCHEDULE

FROM	TO	QTY X COST	TOTAL COST
		OPTIMUM SOLUTION	

Q.12) A manufacturer has distribution centers at X,Y and Z. These centers availability of 120, 95 and 85 units. His retail outlets at A,B,C and D require 50,60,90 and 100 units respectively. The transportation cost (in rupees) per unit between each center and outlets is as given below.

DISTRIBUTION CENTER	RETAIL OUTLETS			
	A	**B**	**C**	**D**
X	3	1	3	5
Y	2	6	1	3
Z	5	1	4	8

Determine the optimum distribution to minimize the cost of transportation. Use NWCR to obtain initial solution.

Solution:

	A	**B**	**C**	**D**	**SS**
X	3	1	3	5	120
Y	2	6	1	3	95
Z	5	1	4	8	85
DD	50	60	90	100	

IBFS=_____

_____

Prof.Shahid Qureshi
(9664847492)

TRANSPORTATION

RIM CONDITION = ____

____

TEST OF OPTIMALITY

	A	B	C	D	Ui
X	3	1	3	5	U1 =
Y	2	6	1	3	U2 =
Z	5	1	4	8	U3 =
V1	V1 =	V2 =	V3 =	V4 =	

	A	B	C	D	Ui
X	3	1	3	5	U1 =
Y	2	6	1	3	U2 =
Z	5	1	4	8	U3 =
V1	V1 =	V2 =	V3 =	V4 =	

	A	B	C	D	Ui
X	3	1	3	5	U1 =
Y	2	6	1	3	U2 =
Z	5	1	4	8	U3 =
V1	V1 =	V2 =	V3 =	V4 =	
	A	**B**	**C**	**D**	**Ui**

TRANSPORTATION

X	3	1	3	5	U1 =
Y	2	6	1	3	U2 =
Z	5	1	4	8	U3 =
V1	V1 =	V2 =	V3 =	V4 =	

TRANSPORTATION SCHEDULE

FROM	TO	QTY X COST	TOTAL COST
		OPTIMUM SOLUTION	

Q.13) Four warehouses with capacities of 85,35,50 and 45 tons were receiving the materials from 3 factories with their supply capacity as 70,55 and 90 tons on regular bases. The transportation costs per tons from factories to warehouses are given in the following table:-

FACTORY	WAREHOUSE			
	1	**2**	**3**	**4**
I	6	1	9	3
II	11	5	2	8
III	10	12	4	7

A feasible solution states that from Factory I 25 tons have to be transported to Warehouse 3 and 45 tons to warehouse 4. Similarly 30 tons and 25 tons were transported from Factory II to warehouse 1 and warehouse 3 respectively. However from Factory III 55 tons and 35 tons were transported to warehouse 1 and warehouse 2 respectively.

Are the transportation schedule are optimum? If not, modify it and obtain optimum solution and optimum cost.

Q.14) Priyanshu Enterprise has three factories at locations A,B,C which supply to three warehouses located at D,E,F. The monthly factory capacities are 10,80 and 15 units respectively. The monthly warehouse requirements are 75,20 and 50 units respectively, units shipping cost are given below:

FACTORY/WAREH	D	E	F
A	5	1	7
B	6	4	6
C	3	2	5

The penalty costs for not satisfying the demands at the warehouses D,E,F are Rs. 5, Rs. 3, and Rs. 2 per unit respectively. Using VAM. Find the IBFS. Test for Optimality.

Prof.Shahid Qureshi
(9664847492)