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Q. A company has a current shipping schedule, which is being questioned by the management as to whether or not it is optimal. The firm has 3 factories and 4 warehouse. the necessary data in terms of transportation cost in ₹ per unit from a factory to a destination and F & Cap. and W. Requires

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Warehouse	W_1	W_2	W_3	W_4	Requirements
Factory					
F_1	19	30	50	10	720
F_2	40	30	40	60	900
F_3	40	08	70	20	1800
capacity	500	800	700	1400	

Solve for a basic feasible shipping schedule in terms of lowest possible shipping cost.

Sol:- As $\leq$ capacity $= \leq$ Requirements, the above problem is balanced.
We will use Vagels Approximation Method to solve the above problem.

Requirements = 700 + 900 + 1800 = 3400

capacity = 500 + 800 + 700 + 1400 = 3400

Requirements = 700 + 900 + 1800 = 3400

capacity = 500 + 800 + 700 + 1400
= 3400

Iteration I

W. F	W_1	W_2	W_3	W_4	Req	Penality
F_1	19	30	50	10	700	9
F_2	40	30	40	60	900	10
F_3	40	08	70	20	1800	12
capacity	500	800	700	1400	3400	-
Penalties	21	22	10	10	-	-

Iteration II

W F	W_1	W_2	W_3	W_4	Req	Penalties
F_1	19 (500)	50	10		700 (200)	9
F_2	40	40	60		900	20
F_3	40	70	20		1000	20
capacity	500	700	1400		2600	-
Penalties	21 ↑	10	10		-	-

Iteration III

W.F	W_3	W_4	~~W_5~~	~~W_6~~	Req	Penalties
F_1	50	10		20	40	
F_2	40	60 (1000)		900	20	
F_3	70	20		1000	50	
Capacity	700	1400 (400)		2100	-	
Penalties	10	10		-	-	

Iteration IV

W.F	W_3	W_4	Required	Penalties
F_2	40	60 (1200)	900	-
Capacity	700	200	900	-
Penalties	-	-		-

Iteration V

W.F	W_3	W_4	Req	P
F_2	40 (1700)	60 (1200)	900	-
Cap	700	200	900	-
Penalties	-	-		

W.F	W_1	W_2	W_3	W_4	Requirements
F_1	19 (1500)	30	50	10 (1200)	700
F_2	40	30	40 (1200)	60 (1300)	900
F_3	40	08 (1300)	70	20 (1500)	1800
Cap	500	800	700	1400	

Total Cost = $19 \times 500 + 10 \times 200 + 40 \times 700 + 60 \times 200 + 8 \times 300 + 20 \times 1000$

$= 9500 + 2000 + 2800 + 12000 + 6400 + 20000$

$= 52700$