

23) Solve minimal assignment:

	1	2	3	4
A	1	26	17	11
B	13	28	4	26
C	38	19	18	15
D	19	26	24	10

Sol Row wise

steps:

D	25	16	10
9	24	0	22
23	4	3	0
9	16	14	0

Step 2 :- Column wise

	I	II	III	IV
A	0	21	16	10
B	9	20	0	22
C	23	0	3	0
D	9	12	14	0

∴ The assignments are $A \rightarrow I = 1$

$B \rightarrow III = 4$

$C \rightarrow II = 19$

$D \rightarrow IV = 10$

Min Cost = 34

2) men to jobs find assignment.

		1	2	3	4
Men	A	20	25	22	28
	B	15	18	23	17
	C	19	17	21	24
	D	25	23	24	24

Sol

Step 1 :- Row wise.

0	5	2	8
0	3	8	2
2	0	4	7
2	0	1	1

Step 2 :- Column wise :-

<u>0</u>	5	1	7
0	3	7	1
2	<u>0</u>	3	6
2	0	<u>0</u>	0

Step 3 :- Select least no. from uncovered matrix.

	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
Men A	<u>0</u>	5	0	6
B	0	3	6	<u>0</u>
C	2	<u>0</u>	2	5
D	3	1	<u>0</u>	0

∴ The assignments are, Men A → I = 20

$$B \rightarrow \underline{IV} = 17$$

$$C \rightarrow \underline{II} = 17$$

$$D \rightarrow \underline{III} = 24$$

$$\text{Min Cost} = \underline{\underline{78.}}$$

Resulting line in minutes.

17) Four jobs & machines. Find assignments.
machines.

	A	B	C	D
Jobs I	42	35	28	(21)
II	30	25	20	(15)
III	30	25	20	(15)
IV	24	20	(16)	12

Find optimum assignment & corresponding profit.

Sol. Row wise:-

Step 1:

21	14	7	0
15	10	5	0
15	10	5	(0)
(8)	(4)	(0)	4

Step 2:Column wise:-

13	10	7	(0)
7	6	(5)	0
7	6	5	0
(0)	0	0	4

Step 3 :-

8	5	2	10
2	1	0	0
2	1	0	0
0	0	0	9

Step 4 :-

Machines.

	A	B	C	D
I	7	4	2	0
II	1	0	0	0
III	1	0	0	0
IV	0	0	1	10

∴ The Assignments are $I \rightarrow D = 21$

$II \rightarrow B = 25$

$III \rightarrow C = 20$

$IV \rightarrow A = 24$

Min ~~cost~~ = 90 ~~mins~~

Min times = 90 minutes

16) Assignment Problem:-

	A	B	C	D
I	23	20	21	24
II	19	21	20	20
III	20	18	24	22
IV	22	18	21	23

Sol

Step 1:- Row wise:-

3	0	1	4
0	2	1	1
2	0	6	4
4	0	3	5

Step 2:- Column wise

3	0	0	3
0	2	0	0
2	0	5	3
4	0	2	4

Step 3:

	A	B	C	D
I	1	6	2	2
II	2	4	2	2
III	2	0	5	1
IV	2	1	2	2

∴ The assignments are $I \rightarrow C = 21$

$II \rightarrow D = 20$

$III \rightarrow A = 20$

$IV \rightarrow B = 18$

Min Cost = 79

19) Solve assignment.

	I	II	III	IV	V
A	6	5	8	11	16
B	1	13	16	1	10
C	16	11	8	8	8
D	19	14	12	10	16
E	10	13	11	8	16

Sol Step 1:- Row wise.

1	0	3	6	11
0	12	15	0	9
8	3	0	0	0
0	5	3	1	7
0	3	1	2	6

Step 2:- Column wise

1	0	3	6	11
0	12	15	0	9
8	3	0	0	0
0	5	3	1	7
0	3	1	2	6

Step 3:-

	I	II	III	IV	V
A	1	0	2	5	10
B	0	12	14	0	8
C	0	4	0	1	0
D	0	5	2	1	6
E	0	3	0	2	5

∴ The assignments are

A	→	IV	= 5
B	→	II	= 1
C	→	V	= 0
D	→	I	= 9
E	→	III	= 11

min Cost = 34

14) Assignment

	A	B	C	D
Jobs	I 10	25	15	20
II	15	30	5	15
III	35	20	12	24
IV	17	25	24	20

Sol Row Wise (Step 1) :-

0	15	5	10
10	25	0	10
23	8	0	12
0	8	7	3

Step 2 :- Column Wise :-

	A	B	C	D
I	0	7	5	7
II	10	17	0	7
III	23	0	0	9
IV	0	0	7	0

∴ The Assignments are

I	→	A	=	10
II	→	C	=	5
III	→	B	=	20
IV	→	D	=	20

Min Cost = 55

15) Assignment Problem:

	1	2	3	4
A	10	12	19	11
B	5	10	7	8
C	12	14	13	11
D	8	15	11	9

Step 1 :- (Row wise)

0	2	9	1
0	5	2	3
1	3	2	0
0	7	3	1

Step 2 :- (Column wise)

	1	2	3	4
A	0	0	7	1
B	0	3	0	3
C	1	1	0	0
D	0	5	1	1

∴ The Assignments are

A	→	2	=	12
B	→	3	=	7
C	→	4	=	11
D	→	1	=	8
Min Cost =				<u><u>38</u></u>