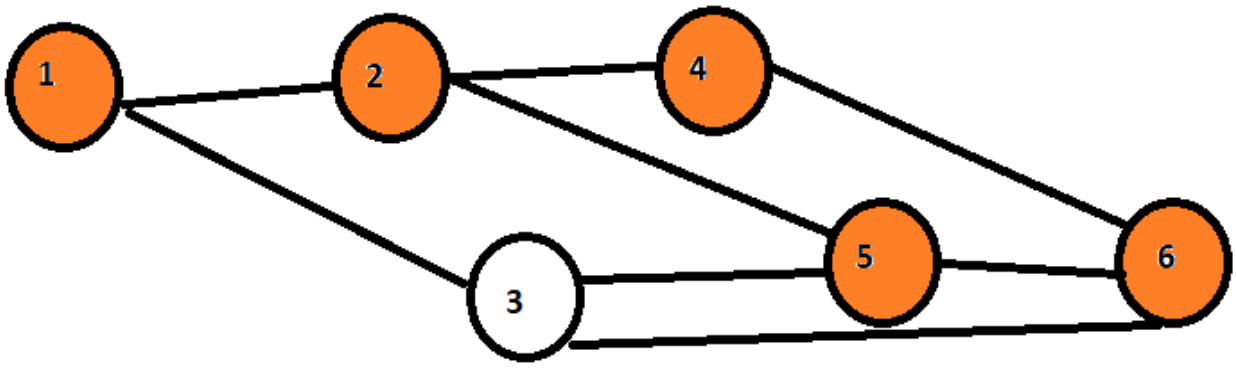
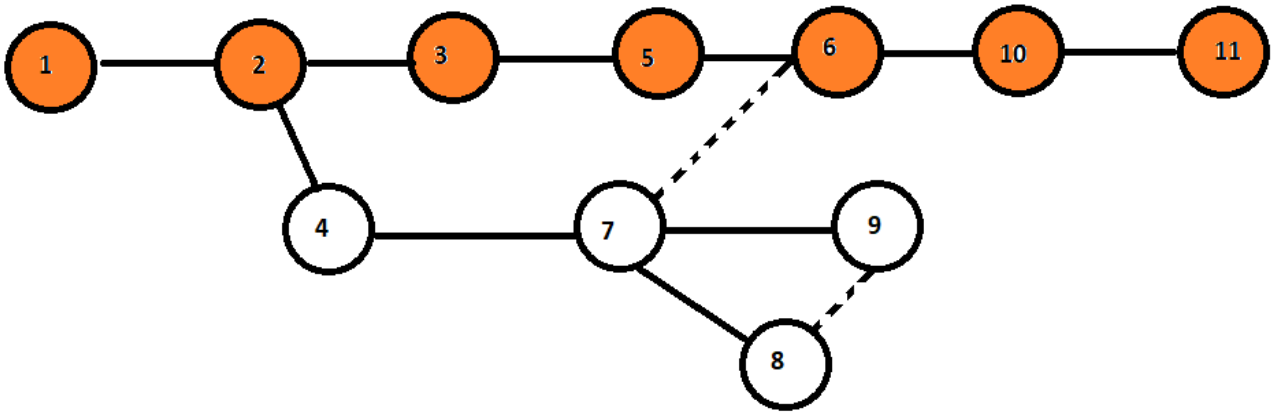


Solution 1

Path	Time	Total
1-2-5-6	4+3+6	13
1-2-4-5-6	4+8+5+6	23
1-2-4-6	4+8+2	14
1-3-5-6	7+9+6	22
1-3-6'	7+5	12

The critical path is 1-2-4-5-6

Solution 2



Node	ES	EF
1	0	10
2	10	18
3	18	24
4	10	15
5	24	32
6	32	36
7	22	24
8	22	25
9	25	28
10	36	38

Node	LS	LF	Float
1	0	10	0
2	10	18	0
3	18	24	0
4	18	23	8
5	24	32	0
6	32	36	0
7	30	33	8
8	31	33	9
9	33	36	8
10	36	38	0

Critical path is 1-2-3-5-6-10-11 with duration 38

Solution 3

Node	ES	LS	Float
1	0	0	0
2	8	8	0
3	12	12	0
4	3	18	15
5	5	20	15
6	21	21	0
7	33	52	19
8	28	28	0
9	51	53	2
10	42	42	0
11	58	58	0
12	53	72	19
13	63	63	0
14	75	75	0
15	78	78	0

Critical path is 1-3-6-10-11-14-15 with duration 78.

Solution 4

The current critical path is C-F-I-J-K-M-N-P with a total duration of 27 weeks. To reduce the time there are some activities which need to be crashed.

Activity	Crash Cost	Normal Cost	Added Cost (Cc-Nc/Nt-Ct)
C	5000	3600	1400
F	5000	3200	1800
I	7600	7200	200
J	2200	1600	600
K	4500	3000	1500
M	3000	1600	1400
N	700	700	-
P	1600	1600	1400

On the basis of reduction of time and their total added cost below activities will be crashes to reduce the project completion time.

- Crash I to reduce 2 weeks for $400
- Crash J to reduce 1 week for $600
- Crash C to reduce 1 week for $1400
- Crash P to reduce 1 week for $1400
- Crash M to reduce 1 week for $1400
- Crash K to reduce 1 week for $1500
- Crash F to reduce 1 week for $1800

Total crash cost $8500 with time reduced by 8 weeks with additional critical path: B-2, E-5, G-3.