

Name: _____

ID: _____

AEC 258 Spring 2019

Assignment 3 (50 points) -- solution

Due date: 3/31/2019

1. Describe the four different solutions for a network. (10 points)

All normal: the original network, based on each activity being performed in its normal least cost manner. However, this is not necessarily the least cost or least time solution to a project schedule.

Least cost: the project duration with the minimal cost after considering both direct and indirect costs. This least cost solution will be shorter than the all-normal solution.

Least time: A project can continue to be shortened beyond its least cost point. This additional shortening increases the total cost of the project. Eventually, the least time solution is reached, which is the absolute minimum duration within which the project can be completed.

All crash: every individual activity has been shortened as much as physically possible. Its duration is the same as the least time solution, but its cost is greater.

2. Describe four elements of project costs. (10 points)

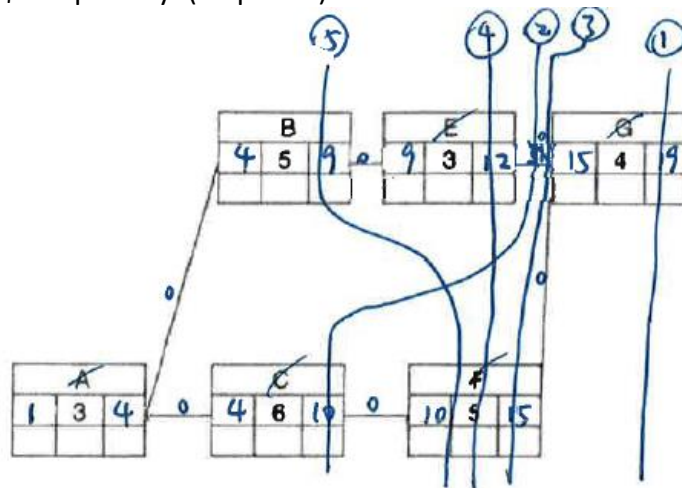
Direct field costs: the costs readily identified as being related to putting the facility components in place.

Indirect field costs: not specifically identified as being associated with a particular work item, but specifically related to one project.

Overhead: the elements covering company-specific costs of running the business

Profit: company's profit

3. Figure out the least-time and least-cost schedule of the following project. Assume the indirect cost is \$100 per day. (20 points)



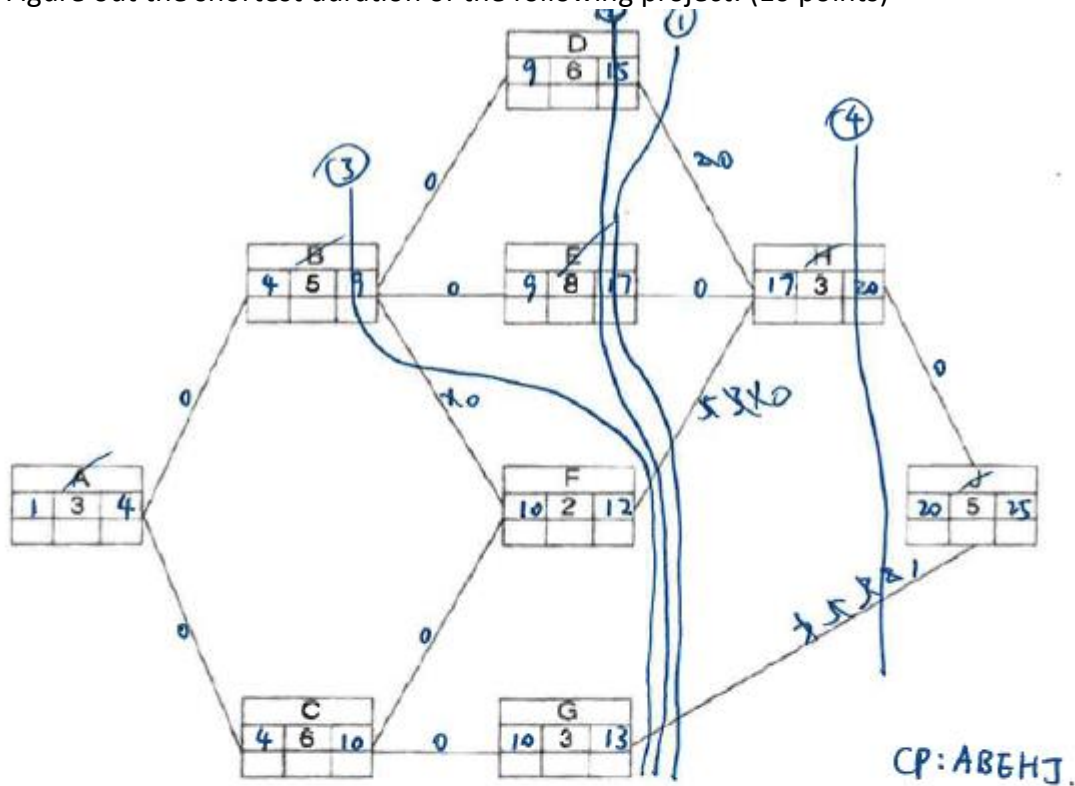
CP: ACFG

Activity #	Time Normal	Time Crash	Cost Normal	Cost Crash	Time Difference	Cost Difference	Slope \$/day
A	3	3	100	100	0	0	—
B	5	3	200	500	2	300	150
C	6	4	400	560	2	160	80
E	3	2	200	260	1	60	60
F	5	2	250	520	3	270	90
G	4	2	200	270	2	70	35

Cycle	Activity to shorten	Can be shortened	Nil	Days shortened	Cost per day	Cost for cycle	Total direct cost	Project duration	Total cost
0							1350	18	3150
1	G	2	0	2	35	70	1420	16	3020
2	C	2	3	2	80	160	1580	14	2980
3	F	3	1	1	90	90	1670	13	2970
4	E, F	1	00	1	150	150	1820	12	3020
5	B, F	1	00	1	240	240	2060	11	3160

← least cost
← least time.

4. Figure out the shortest duration of the following project. (10 points)



Activity #	Time Normal	Time Crash	Cost Normal	Cost Crash	Time Difference	Cost Difference	Slope \$/Day
A	3	3	\$600	\$600	0	0	∞
B	5	4	\$250	\$340	1.0	90	90
C	6	3	\$180	\$840	3	660	220
D	6	3	\$300	\$450	3.1	150	50
E	8	4	\$200	\$340	4.20	140	35
F	2	1	\$500	\$560	1	60	60
G	3	2	\$700	\$740	1	40	40
H	3	2	\$900	\$1000	1.0	100	100
J	5	5	\$100	\$100	0	0	∞

Cycle	Activity to shorten	Can be shorten	Nil	Days shortened	Cost per day	Cost for cycle	Total direct cost	Project duration
0							3730	24
1	E	4	2	2	35	70	3800	22
2	D, E	2	3	2	85	170	3970	20
3	B	1	1	1	90	90	4060	19
4	H	1	2	1	100	100	4160	18
5								

← least time