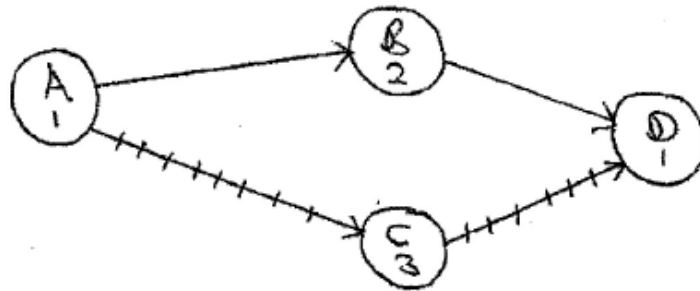


SPRING 2015

R. GUNTHER

HOMEWORK SOLUTIONS SET # 2



CRITICAL PATH IS A-C-D, LENGTH = 5

	PMF	COF	
MEAN - 1	.3	.3	COF IS CUMULATIVE PROBABILITY.
MEAN	.4	.7	
MEAN + 1	.2	.9	
MEAN + 2	.1	1.0	

SIMULATION:

RN	B	RN	C	CRITICAL PATH	LENGTH
.28	1	.46	3	ACD	5
.97	4	.09	2	ABD	6
.63	2	.33	3	ACD	5
.53	2	.76	4	ACD	6
.73	3	.92	5	ACD	7

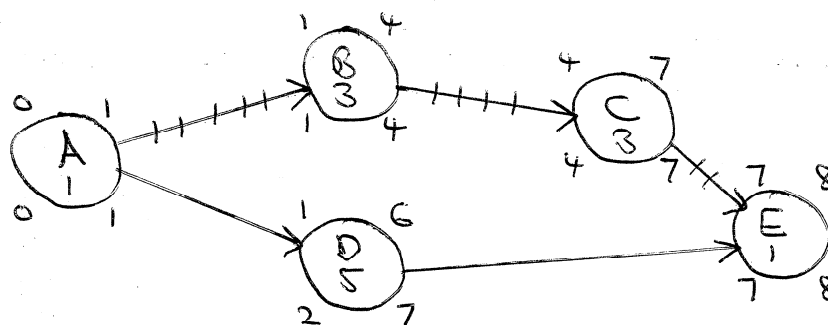
EXPECTED (AVERAGE) PROJECT LENGTH IS 5.8

CRITICALITY INDEX OF ACD IS .8

CRITICALITY INDEX OF ABD IS .2

2

2



CRITICAL PATH IS A-B-C-E, LENGTH IS 8.

	PMF	CDF
MEAN - 2	.1	.1
MEAN - 1	.2	.3
MEAN	.3	.6
MEAN + 1	.2	.8
MEAN + 2	.2	1.0

RN	B	RN	C	RN	D	CRITICAL PATH	LENGTH
.60	3	.42	3	.37	5	A-B-C-E	8
.53	3	.11	2	.61	6	A-D-E	8
.24	2	.93	5	.02	3	A-B-C-E	9
.16	2	.63	4	.53	5	A-B-C-E	8
.98	5	.74	4	.95	7	A-B-C-E	11

MEAN LENGTH IS 8.8

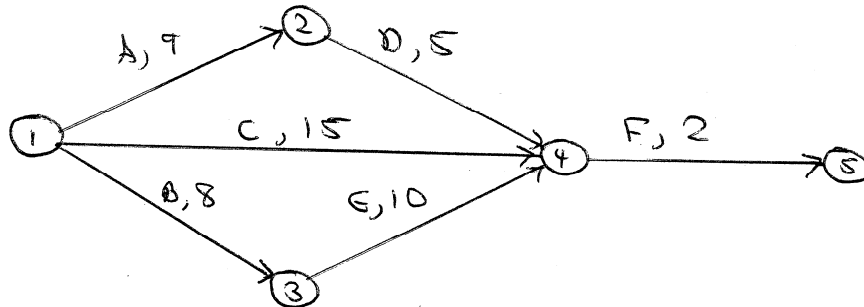
CRITICALITY INDEX OF A-B-C-E IS .8

CRITICALITY INDEX OF A-D-E IS .2

3.

3.

AOA DIAGRAM



PATHS		NORMAL :	MINIMUM :
	ADF	16	10
	CF	17	11
	BEF	20	12

BEF IS CRITICAL PATH, PROJECT NORMAL LENGTH IS 20, MINIMUM LENGTH IS 12.

CRASHING :

TIME	REDUCED	COST	CUMULATIVE COST
19	E (9)	\$ 15	\$ 15
18	E (8)	15	30
17	E (7)	15	45
16	F (1)	40	85
15	C (14), E (6)	45	130
14	B (7), C (13), D (4)	65	195
13	B (6), C (12), D (3)	65	260
12	B (5), C (11), A (8)	75	335

PROJECT CAN ONLY BE REDUCED TO A MINIMUM OF 12.

4.

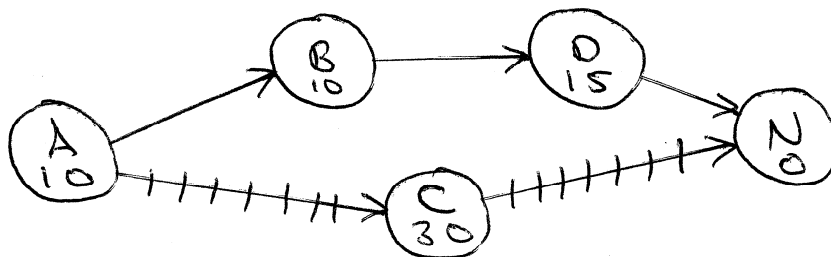
3. (CONT'D)

COST ANALYSIS :

TIME	CRASH COST (SEE PAGE 2)	OVERHEAD (TIME X CO)	TOTAL COST
20	\$ 0	\$ 1200	\$1200
19	15	1140	1155
18	30	1080	1110
17	45	1020	1065
16	85	960	1045
15*	130*	900*	1030*
14	195	840	1035
13	260	780	1040
12	335	720	1055

* TIME OF 15 MINIMIZES COSTS.

4. LOWEST COST SCHEDULE IS AT MAXIMUM TIMES. SO WE START :



A C IS CRITICAL AT TIME OF 40.

(CONTINUED)

4 (CONT)

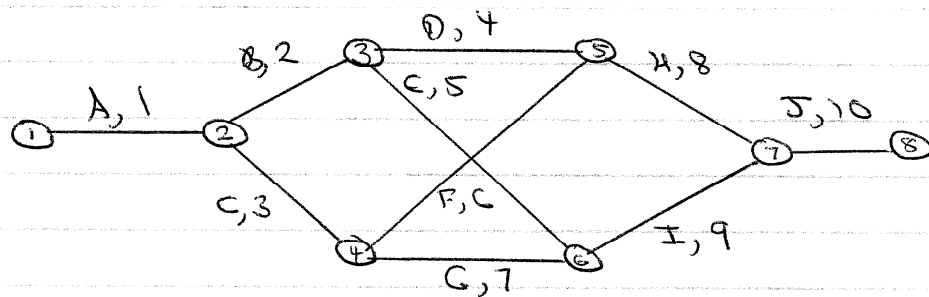
5

LENGTH	ACTIONS	COST	CUMULATIVE COST
40	NONE	\$ 0	\$ 215**
35	C (25)	10	225
30	A* (5)	15	240
25	B* (5), C (20)	20	260
20	D* (10), C (15)	35	<u>295</u>

* AT MINIMUM

** \$ 215 = (70 + 80 + 40 + 25)

5.



a. CRITICAL PATH: A-C-G-I-J - 30
 A-C-F-H-J - 28
 A-B-E-I-J - 27
 A-B-D-H-J - 25

LENGTH	ACTION	COMMENTS	COST	CUMULATIVE COST
30	NONE		\$ 0	\$ 0
28	* C (1)	(A-C-G-I-J) STILL CRIT.	6	6
27	G (6)	(A-C-G-I-J) & (A-B-E-I-J) CRITICAL	7	13
26	I (8)	IGNORE BOTH PATHS	9	<u>22</u>

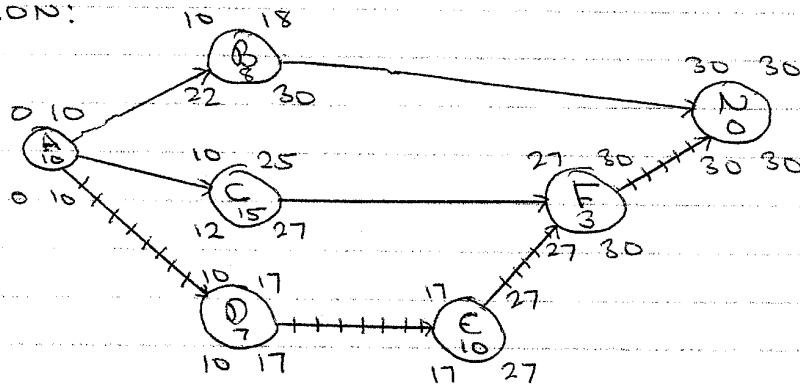
PROJECT IS SHORTENED BY
 4 TO 26 DAYS.

6.

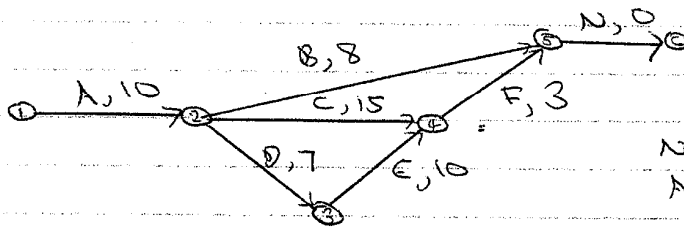
6.

ANSWER -

AON:



AOA OR PERT:



NOTE:
N ARROW COULD
ALSO BE DOTTED.

LENGTH OF PATHS:
 A-D-E-F-N: 30
 A-C-F-N: 28
 A-B-N: 18

ACTIVITY	TOTAL SLACK	FREE SLACK
A, D, E, F	0	0
B	12	12
C	2	2

CRASHING CAN BE DONE TO
25 & IS ON NEXT PAGE.

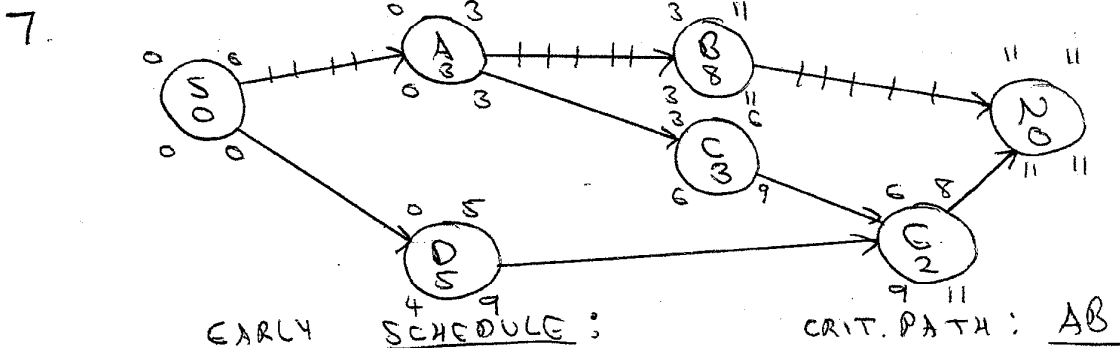
7.

G. (CON'T)

CRASHING :

TIME	ACTION	COST	CUMULATIVE COST
30	NONE	\$ 0	\$ 0
29	D*(6)	10	10
28	E (9)	12	22
27	A (9)	20	42
26	A*(8)	20	62
25	C(14), E*(8)	32	<u>94</u>

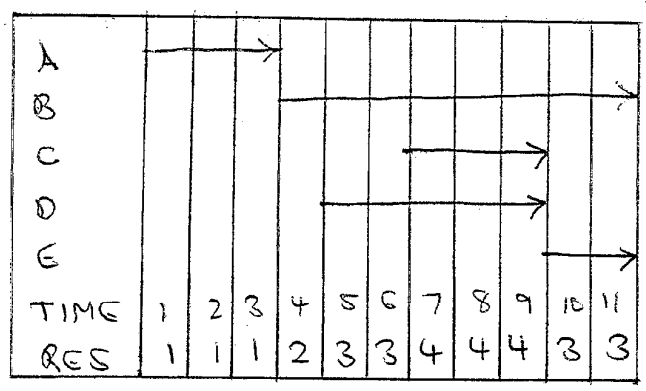
* ACTIVITY AT MINIMUM TIME.



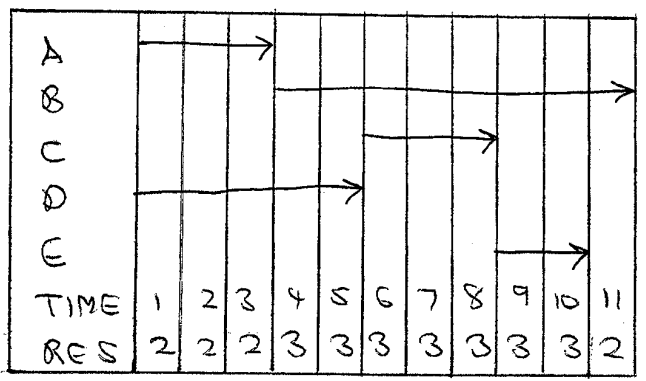
A	→										
B				→							
C					→						
D						→					
E							→				
TIME	1	2	3	4	5	6	7	8	9	10	11
RES	2	2	2	4	4	3	3	3	2	2	2

7. (CONT)

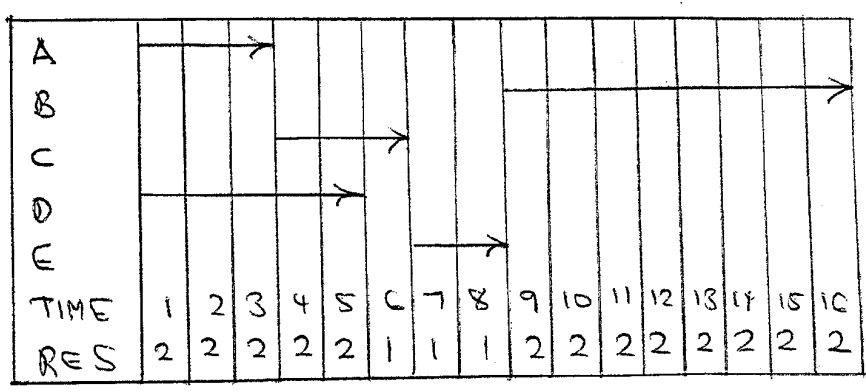
LATE SCHEDULE



BEST SCHEDULE

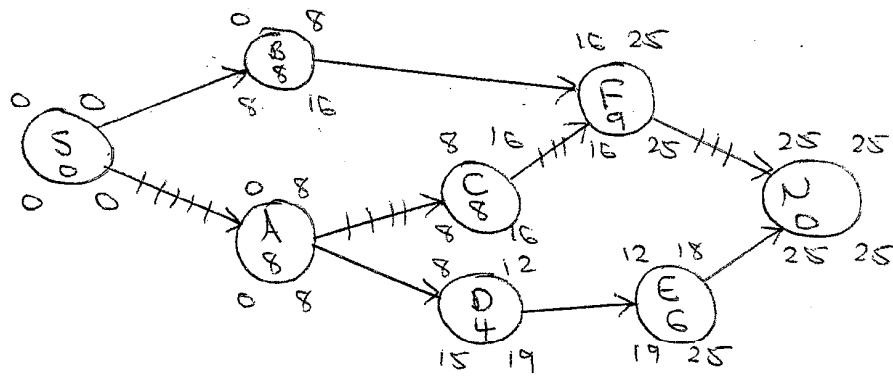


8.



9.

9.



EARLY TIMES :

A							
B							
C							
D							
E							
F							
TIMES	4	8	12	16	20	24	25
RES.	10	10	8	10	11	6	

OPTIMUM SCHEDULE :

A							
B							
C							
D							
E							
F							
TIMES	4	8	12	16	18		
RES	12	12	12	12	12		

CREW:

- 8 MAX.
- 4 MIN.
- 5 NORM.
- 3 NORM.
- 3 MIN.
- 9 MAX.