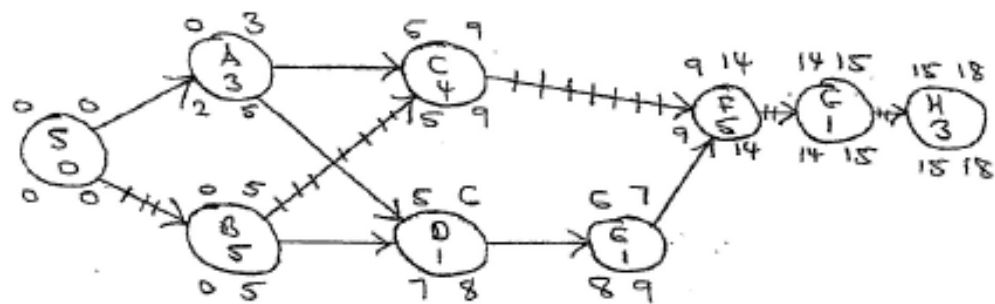


SPRING 2015

SOM 466
R. GUNTHER

HOMEWORK SOLUTIONS SET # 1

1.



a. CRITICAL PATH IS B-C-F-G-H

LENGTH IS 18

b. ALL TOTAL SLACK (TS) AND
FREE SLACK (FS) ON CRITICAL PATH
IS 0.

THE REST:

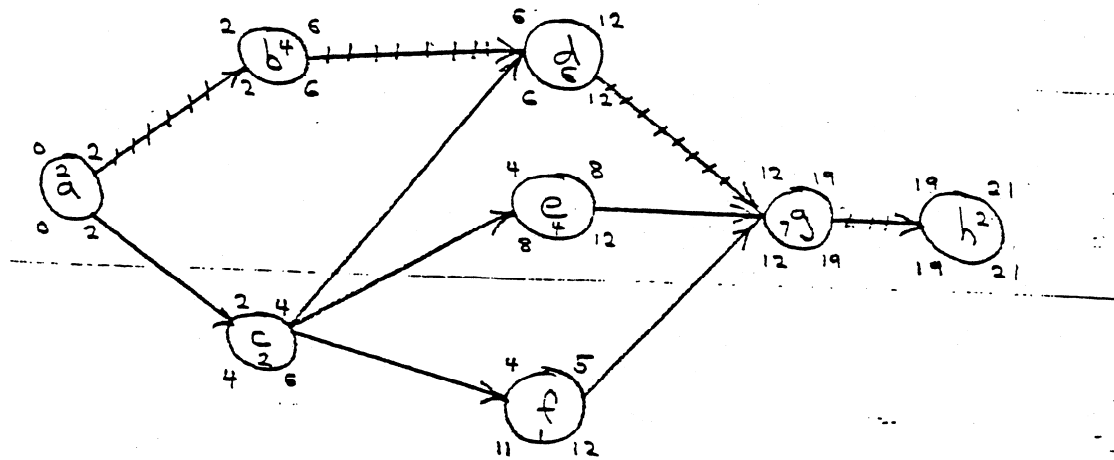
ACTIVITY	TS	FS
A	2	2
D	2	0
E	2	2

NOTE THAT

$$FS \leq TS$$

SOLUTIONS SET 1

2. a) CPM OR ACTIVITY ON NODE DIAGRAM WITH CALCULATIONS.



CRITICAL PATH : a-b-d-g-h

b).	<u>ACTIVITY</u>	<u>FS</u>	<u>TS</u>
	a	0	0
	b	0	0
	c	0	2
	d	0	0
	e	4	4
	f	7	7
	g	0	0
	h	0	0

SOLUTIONS SET 1

2. c).

<u>ACTIVITY</u>	<u>STANDARD DEVIATION</u>	<u>VARIANCE</u>
a	1/6	1/36
b	10/6	100/36
d	2/6	4/36
g	8/6	64/36
h	0	0
PROJECT VARIANCE	=	<u><u>169/36</u></u>

$$\text{PROJECT STANDARD DEVIATION} = \sqrt{\frac{169}{36}} = \boxed{\frac{13}{6}}$$

$$\text{PROJECT MEAN TIME} = 21$$

$$Z = \frac{\text{DUE DATE} - \text{MEAN}}{\text{STANDARD DEVIATION}} = \frac{25 - 21}{(13/6)} = \boxed{1.846}$$

$P = \text{PROBABILITY FROM NORMAL TABLE} \approx \boxed{.97}$

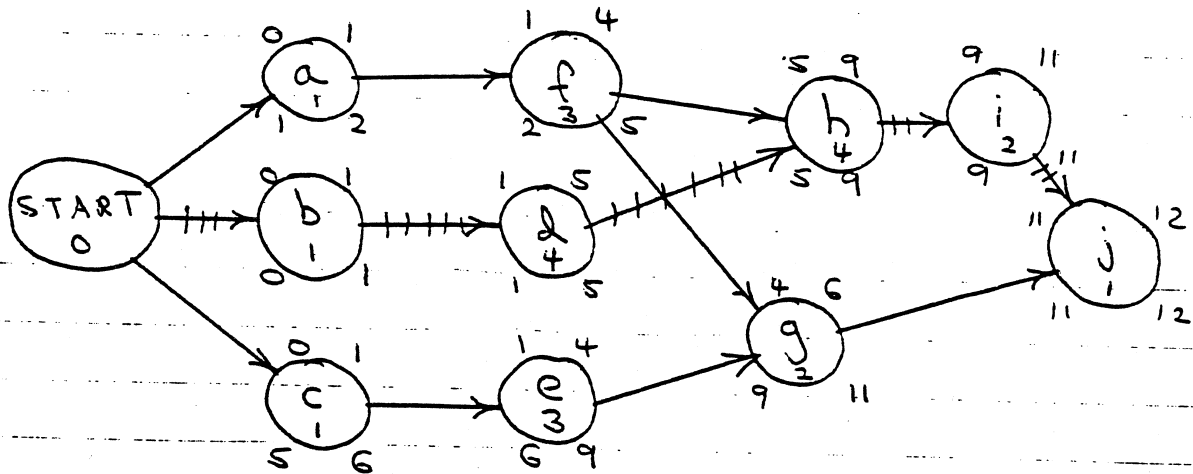
$$\text{PROB LATE} = 1 - P = 1 - .97 = \underline{.03}$$

$$\begin{aligned} P(20-25) &= P(25) - P(20) \quad [Z = -.46 \text{ FOR } P(20)] \\ &= .97 - .32 \\ &= \underline{.65} \end{aligned}$$

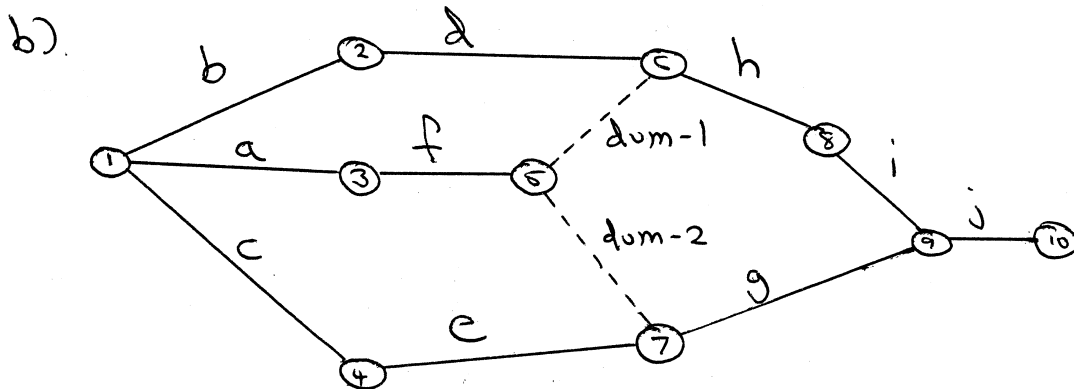
SOLUTIONS SET 1

3.

a) & c).



CRITICAL PATH: b-d-h-i-j



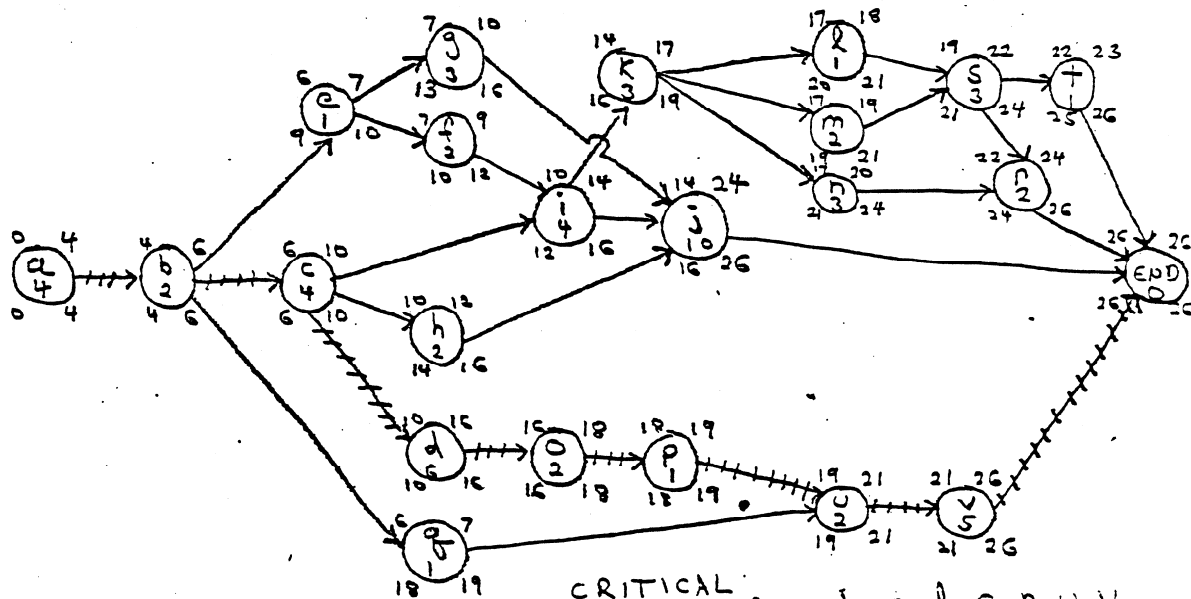
NOTE USE OF DUM-1 & DUM-2.

SOLUTIONS SET 1

4 a).

NETWORK

CALCULATIONS:



CRITICAL PATH : a-b-c-d-o-p-u-v

b).

SLACK:

ACTIVITY

TS

FS

e
f
g
h
i
j
k
l

3
3
6
4
2
2
2
3

0
1
4
2
0
2
0
1

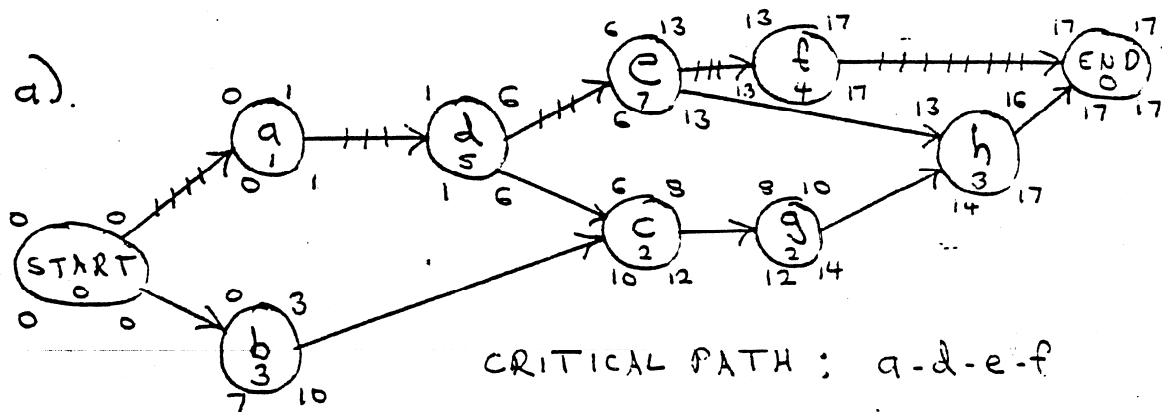
SOLUTIONS SET 1

4. b.

<u>ACTIVITY</u>	<u>TS</u>	<u>FS</u>
m	2	0
n	4	2
g	12	12
r	2	2
s	2	0
t	3	3

5

a).



<u>ACTIVITY</u>	<u>MEAN TIME</u>	<u>TS</u>	<u>FS</u>	<u>S.D.</u>	<u>SD² = VAR</u>
a	1	0	0	0	0
b	3	7	3	—	—
c	2	4	0	—	—
d	5	0	0	2	4
e	7	0	0	2	4
f	4	0	0	1	1
g	2	4	3	—	—
h	3	1	1	—	—

SOLUTIONS SET 1

5b).

MEAN PROJECT COMPLETION TIME = 17

STANDARD DEVIATION = $\sqrt{9}$ = 3

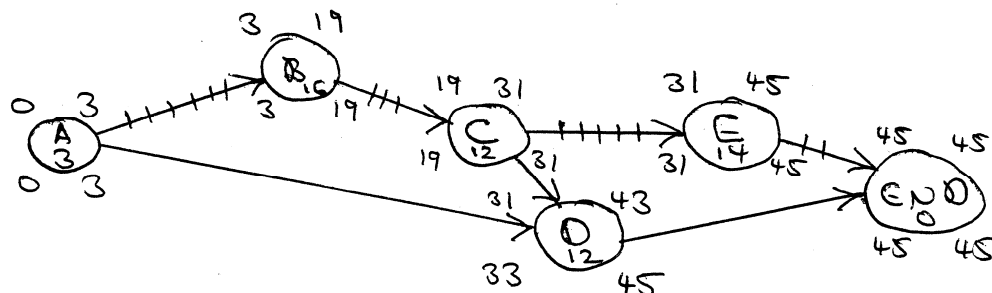
DUE DATE = 18.

$$Z = \frac{\text{DUE DATE} - \text{MEAN}}{\text{S.D.}} = \frac{18 - 17}{3} = +1/3$$

PROBABILITY REPORT ON TIME $\approx .63$ PROBABILITY REPORT IS LATE $\approx 1 - .63 = \underline{.37}$

IN CUTTING THE TIME OF AN ACTIVITY ON THE CRITICAL PATH (E.G. THE REWARD) JOE CAN HELP INSURE THE REPORT IS NOT LATE.

G. a. AON DIAGRAM & CRITICAL PATH COMPUTATIONS

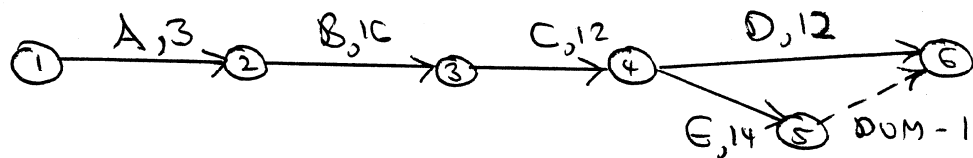


CRITICAL PATH IS A-B-C-E

NOTE THAT ARROW FROM A TO D IS REALLY NOT NEEDED.

SOLUTIONS SET 1

G. a. AOA DIAGRAM:



b. TS & FS ON CRITICAL PATH
IS 0. FOR ACTIVITY D
TS = 2 AND FS = 2.

c.	<u>ACTIVITY</u>	<u>MEAN</u>	<u>SD</u>	<u>SD²</u>
	A	3	0	0
	B	16	4	16
	C	12	3	9
	E	<u>14</u>	0	<u>0</u>
	<u>SUMS</u>	<u><u>45</u></u>		<u><u>25</u></u>

$$Z = \frac{50 - 45}{\sqrt{25}} = \frac{5}{5} = +1$$

$$P = \frac{.84}{1 - P} = \frac{.16}{}$$

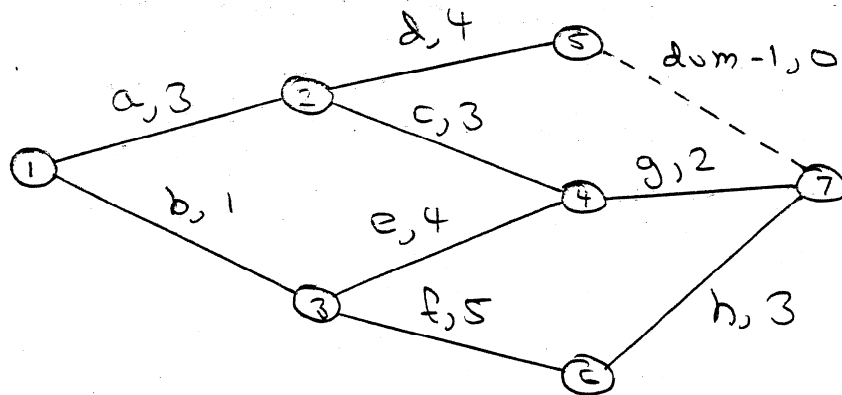
SOLUTIONS SET 1

9.

7.

PROBLEM 22 - TEXT.

a).



a	X	X	X						
b	X								
c				X	X	X			
d				X	X	X	X		
e		X	X	X	X				
f		X	X	X	X	X			
g							X	X	
h							X	X	X
	1	2	3	4	5	6	7	8	9

b) CRITICAL PATH IS bfh

c) COMPLETION TIME IS 9

d) IF ACTIVITY e IS DELAYED:

1 WEEK - PROJECT NOT DELAYED, 9 ^{NOT} DELAYED

2 WEEKS - PROJECT NOT DELAYED, 9 DELAYED
(two CRITICAL PATHS)

3 WEEKS - PROJECT DELAYED BY 1 WEEK