1 Midterm Fall 2017 Width 3
Work 38
Soln 1 Critical Path 20

2 processors

$$\text{Lower bound } C = \frac{38}{2} = 19$$

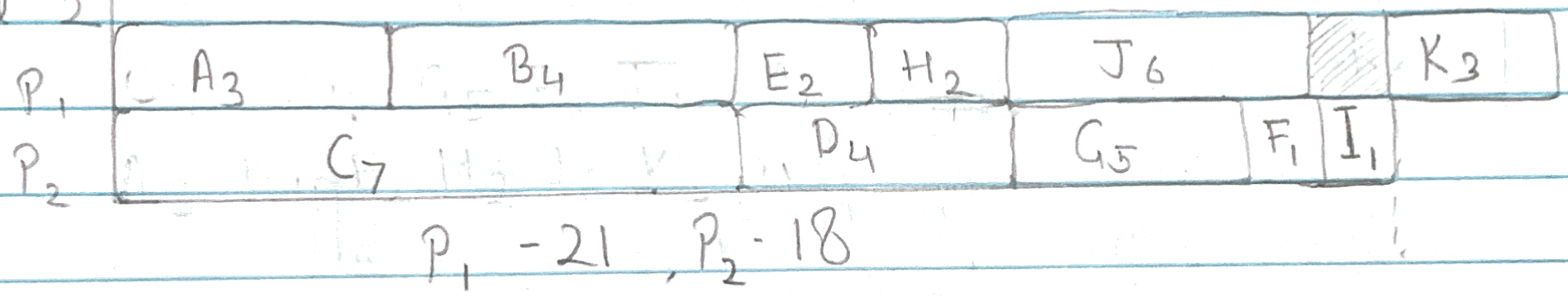
$$\text{Upper bound } C_{max} = \frac{38-20}{2} + 20 = 29$$

3 processors

$$\text{Lower bound } C = \frac{38}{3} = 12.7$$
$$= 13 \text{ approx}$$

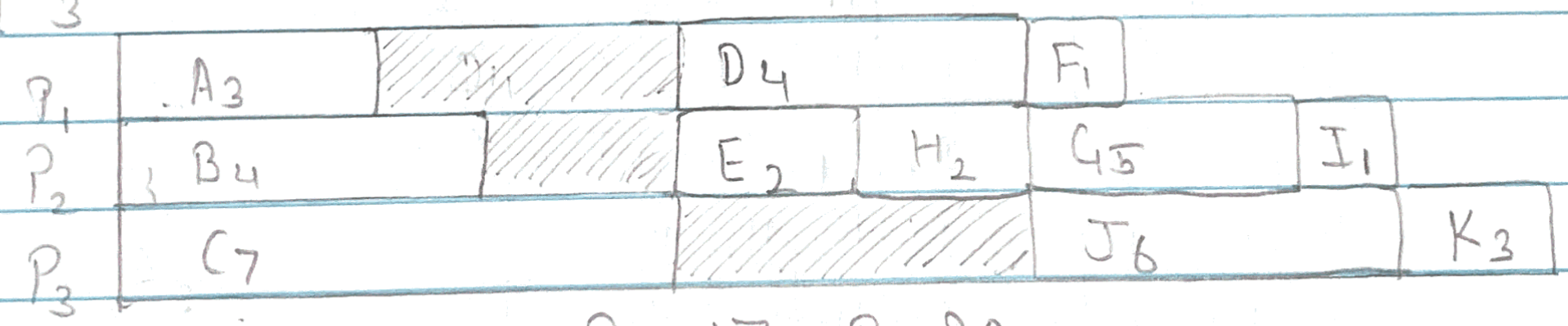
$$\text{Upper bound } C_{max} = \frac{38-20}{3} + 20 = 6+20$$
$$= 26$$

Soln 2



P_1 - 21 , P_2 - 18

Soln 3



P_1 12 , P_2 - 17 P_3 - 20

2. Strassen Width 10
Work 56
Critical Path 10

4 Processors

$$\text{Lower bound } C = \frac{56}{4} = 14$$

$$\text{Upper bound } C_{max} = \frac{56-10}{4} + 10 = 22$$

(Approx

6 processors. Lower Bound $C \geq \frac{56}{6} = 9.4$ 10 (approx)

Upper Bound $C_{max} \frac{56-10}{6} + 10$

$7.6 + 10 = 18$

				1				5	5					(approx
Solution		A_{11}	B_{11}	m_1	m_5	N_2	N_6	P_5	P_7					
P_3		A_{12}	B_{12}	m_2	N_1	M_6	N_7	P_4	T_1	C_{11}	C_{22}			
P_2	B	A_{21}	B_{21}	m_3	m_7	N_4	P_1		P_2		T_2	C_{21}		
P_1	A	A_{22}	B_{22}	N_3	M_4	N_5	P_3		P_6		T_3	C_{12}	C	
	No time			1	1	1	5		5		1	1	0	

Operations

				1	1	5	5					
Solution		B_{12}		m_1	M_4	P_1	P_7			C_{21}	C_0	
P_5		B_{11}		m_2	N_6	P_2	T_1	T_3				
P_4		A_{22}		m_3	N_2	P_5	C_{11}	C_{12}				
P_3		A_{21}		N_3	N_1	P_4	T_2	C_{22}				
P_2	B	A_{12}	B_{22}	m_5	N_4	N_7	P_3					
P_1	A	A_{11}	B_{21}	m_7	N_5	M_6	P_6					
	No time					1	5			1		

Operations

3 Lemon Pie

Work 107

Width 6

Critical Path. 7→8→17→16→18

10+2+20+1+40 = 73

2 Processors

Lower Bound $\sigma = \frac{107}{2} = 53.5$

$= 54$ aprox

Upper Bound $C_{max} = \frac{107-73}{2} + 73$

17+73 = 90

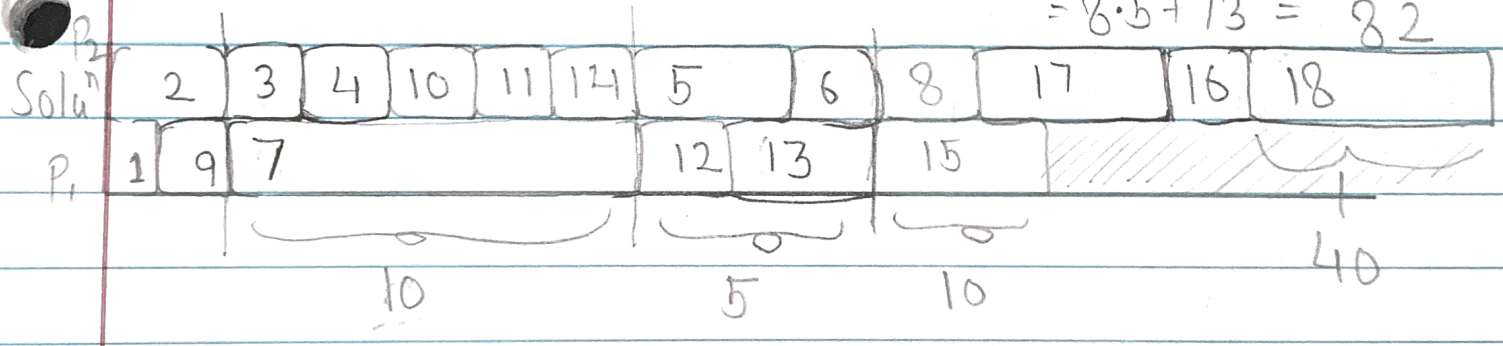
4 Processors

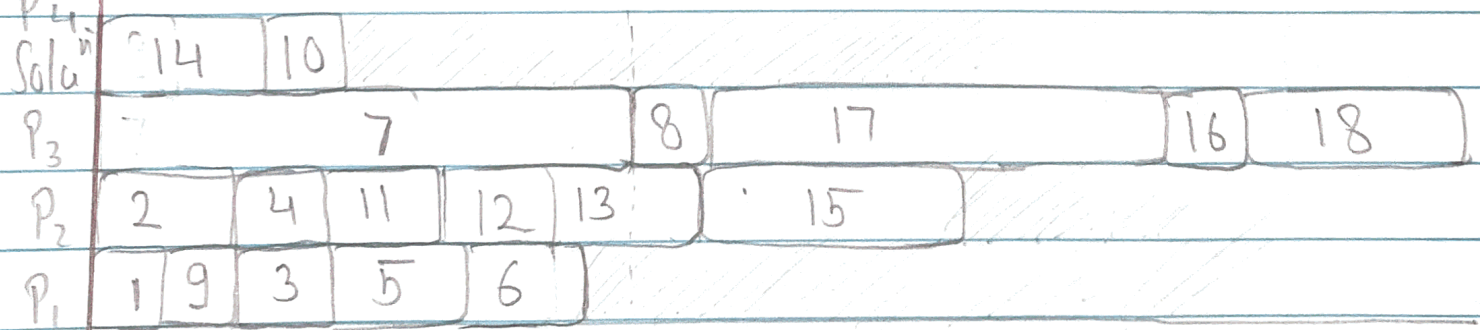
Lower Bound σ $\frac{107}{4} = 26.7$

27 aprox

Upper Bound C_{max} $\frac{107-73}{4} + 73$

$= 8.5 + 73 = 82$





4 Independent Task

Work - 9
Width 7
Critical Path 3

3 processors

$$\text{LowerBound} \leq \frac{9}{3} = 3$$

$$\text{UpperBound} \leq \max \frac{9-3}{3} + 3 = 5$$

4 processors

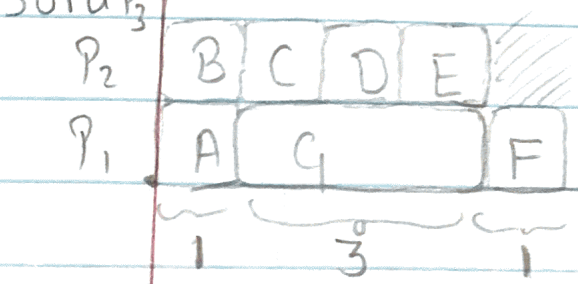
$$\text{Lower Bound} \leq \frac{9}{4} = 2.25$$

3 (approx)

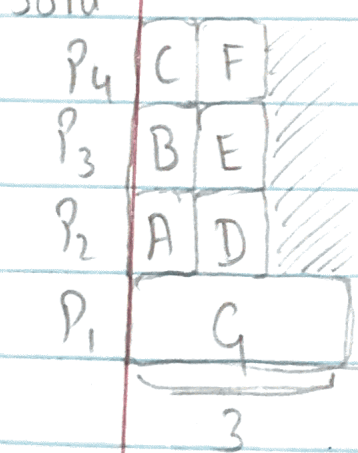
$$\text{Upper Bound} \leq \max \frac{9-3}{4} + 3 \quad 1.5 + 3$$

5 approx

Soln



Soln



5 Independent Task 2

Work - 33
Width - 7
Critical Path 6

3 processors.

Lower Bound $\sigma = \frac{33}{3} = 11$

Upper Bound C_{max} $\frac{33-6}{3} + 6 = 9 + 6$

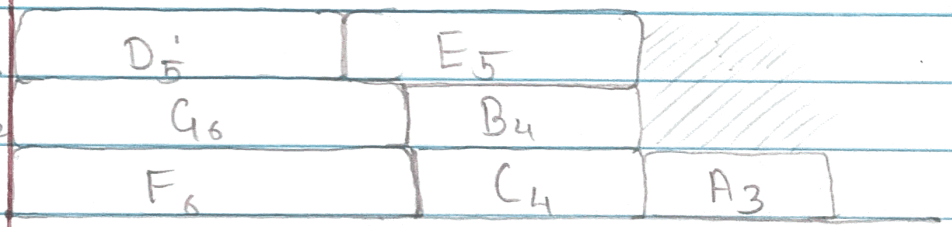
$= 15$

4 processors.

Lower Bound $\sigma = \frac{33}{4} = 8.25 = 9$ (approx)

Upper Bound C_{max} $\frac{33-6}{4} + 6 = 13$ (approx).

Soln



Soln.