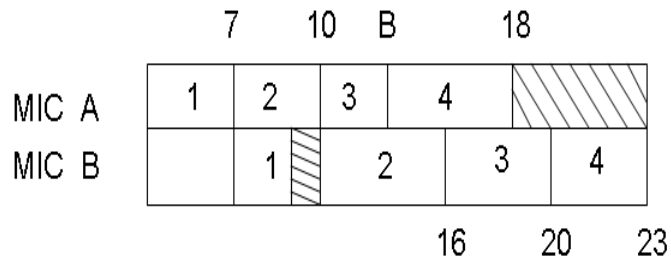


HW #12 Solutions

1.



2. a) FCFS

jobs	C_i	F_i	L_i	T_i	
1	5	5	-5	0	mean flow time = $\frac{5+8+17+24+39}{5} = 18.1$
2	8	8	0	0	mean lateness = $\frac{-5+0+6+8+17}{5} = 5.2$
3	17	17	6	6	mean tardiness = $\frac{0+0+6+8+17}{5} = 6.2$
4	24	24	8	8	#of tardy jobs = 3
5	39	39	17	17	max tardiness = 17

b) SPT

<u>jobs</u>	<u>C_i</u>	<u>F_i</u>	<u>L_i</u>	<u>T_i</u>	
2	3	3	-5	0	$\bar{F} = \frac{3+8+15+24+39}{5} = 18.6$
1	8	8	-2	0	$\bar{L} = \frac{-5-2-1+13+17}{5} = 4.4$
4	15	15	-1	0	$\bar{T} = \frac{0+0+0+13+17}{5} = 6$
3	24	24	13	13	#of tardy jobs = 2
5	39	39	17	17	max tardiness = 17

c) EDD

<u>jobs</u>	<u>C_i</u>	<u>F_i</u>	<u>L_i</u>	<u>T_i</u>	
2	3	3	-5	0	$\bar{F} = \frac{3+8+17+24+39}{5} = 18.2$
1	8	8	-2	0	$\bar{L} = \frac{-5-2+6+8+17}{5} = 4.8$
3	17	17	6	6	$\bar{T} = \frac{0+0+6+8+17}{5} = 6.2$
4	24	24	8	8	#of tardy jobs = 3
5	39	39	17	17	max tardiness = 17

d) CR

$$t = 0 \Rightarrow CR_1 = \frac{10 - 0}{5} = 2 \quad CR_2 = \frac{8 - 0}{3} = 2.66 \quad \textcircled{CR_3} = \frac{11 - 0}{9} = 1.2$$

$$CR_4 = \frac{16 - 0}{7} = 2.3 \quad CR_5 = \frac{22 - 0}{15} = 1.4$$

first \Rightarrow 3

$$t = 9 \Rightarrow CR_1 = \frac{10 - 9}{5} = 0.2 \quad \textcircled{CR_2} = \frac{8 - 9}{3} = 0.33 \quad CR_4 = \frac{16 - 9}{7} = 1$$

$$CR_5 = \frac{22 - 9}{15} = 0.8$$

second \Rightarrow 2

$$t = 12 \quad \textcircled{CR_1} = \frac{10 - 12}{5} = 0.4 \quad CR_4 = \frac{16 - 12}{7} = 0.5 \quad CR_5 = \frac{22 - 12}{15} = 0$$

third \Rightarrow 1

$$t = 17 \Rightarrow \textcircled{CR_4} = \frac{16 - 17}{7} = -0.14 \quad CR_5 = \frac{22 - 17}{15} = 0.33$$

fourth \Rightarrow 4

\Rightarrow last \Rightarrow 5

jobs	C_i	F_i	L_i	T_i	
3	9	9	-2	0	$\bar{F} = \frac{9+12+17+24+39}{5} = 20.2$
2	12	12	4	4	$\bar{L} = \frac{2+4+7+8+17}{5} = 6.8$
1	17	17	7	7	$\bar{T} = \frac{0+4+7+8+17}{5} = 7.2$
4	24	24	8	8	#of tardy jobs = 4
5	39	39	17	17	max tardiness = 17

3.

\Rightarrow sequence by EDD \Rightarrow 2 - 8 - 3 - 4 - 5

$$\begin{array}{l} \Rightarrow C_2 = 3 \quad C_1 = 8 \quad C_3 = 17 \\ \downarrow \\ \text{first tardy job} \end{array} \quad \begin{array}{l} \Rightarrow t_2 = 3t_1 = 5 \\ \text{max so} \\ \text{reject 3} \end{array} \quad \begin{array}{l} \underline{t_3 = 9} \end{array}$$

$$\begin{array}{l} \Rightarrow C_2 = 3 \quad C_1 = 8 \quad C_4 = 15 \quad C_5 = 30 \\ \downarrow \\ \text{first tardy job} \end{array} \quad \begin{array}{l} \Rightarrow t_2 = 3 \quad t_1 = 5 \quad t_4 = 7 \\ \text{max so} \\ \text{reject 5} \end{array} \quad \begin{array}{l} \underline{t_5 = 15} \end{array}$$

and add the rejected jobs 3, 5

$$\begin{array}{l} \downarrow \text{so} \\ \Rightarrow 2 - 1 - 4 \quad \text{sequence: } 2 - 1 - 4 - 3 - 5 \\ \text{or} \\ 5 - 3 \end{array}$$

\Rightarrow #of tardy jobs = 2