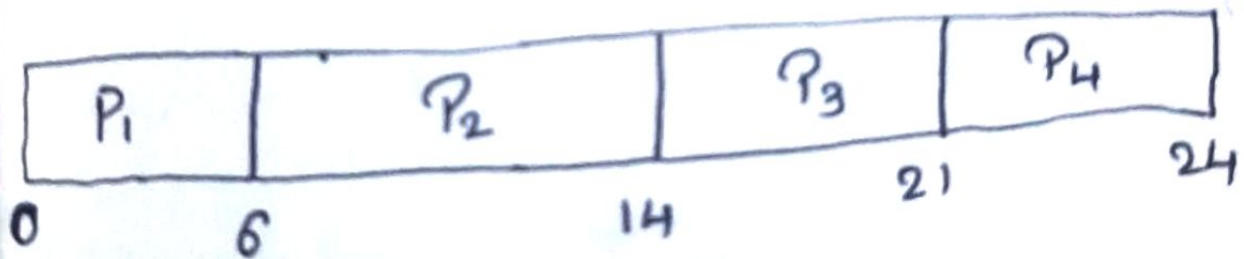


## Non-Preemptive

1] First Come First Serve :

Process	AT	BT	WT	TAT (CT-AT)
$P_1$	0	6	0	$6-0 = 6$
$P_2$	2	8	$6-2 = 4$	$14-2 = 12$
$P_3$	4	7	$14-4 = 10$	$21-4 = 17$
$P_4$	5	3	$21-5 = 16$	$24-5 = 19$



$$\text{Avg. waiting time} = \frac{0 + 4 + 10 + 16}{4} = \frac{30}{4} = 7.5$$

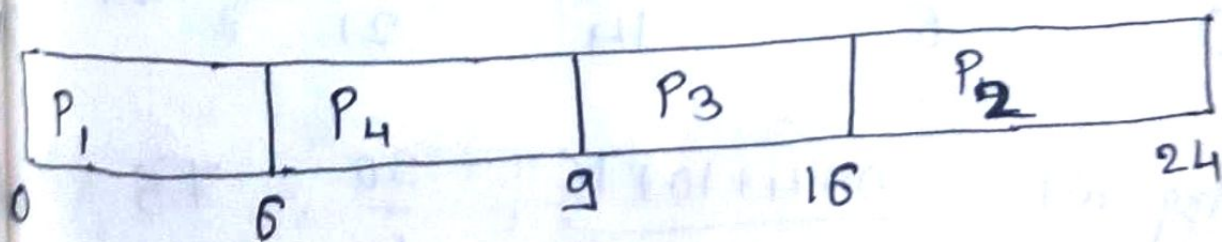
$$\text{Avg. TAT} = \frac{6 + 12 + 17 + 19}{4} = \frac{54}{4} = 13.5$$



## 2] Shortest Job First (Non-Premptive)

Process	AT	BT	CT	WT	TAT
P <sub>1</sub>	0	6	6	0	6-0 = 6
P <sub>2</sub>	2	8	24	16-2 = 14	24-2 = 22
P <sub>3</sub>	4	7	16	9-4 = 5	16-4 = 12
P <sub>4</sub>	5	3	9	6-5 = 1	9-5 = 4

SJF = P<sub>4</sub> → P<sub>1</sub> → P<sub>3</sub> → P<sub>2</sub>



$$\text{Avg. WT} = \frac{0 + 14 + 5 + 1}{4} = \frac{20}{4} = 5$$

$$\text{Avg. TAT} = \frac{6 + 22 + 12 + 4}{4} = \frac{44}{4} = 11$$

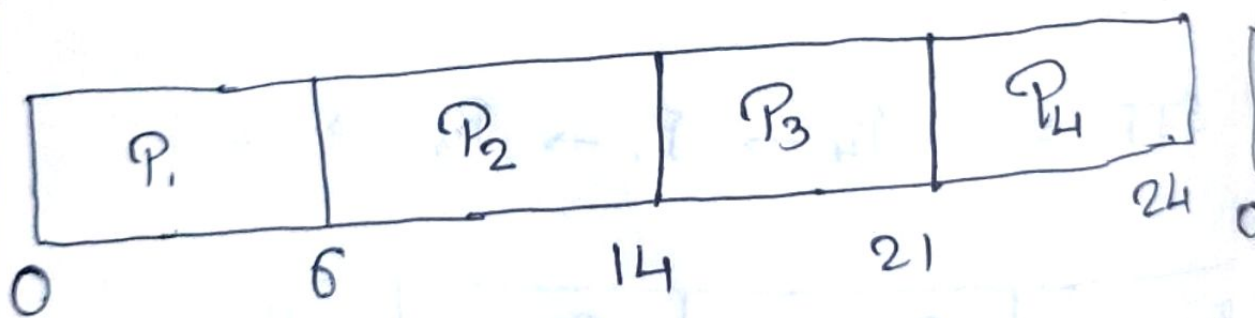




# 8. Longest Job First (Non-Preemptive)

Process	AT	BT	CT	WT	TAT
P <sub>1</sub>	0	6	6	0	6-0=6
P <sub>2</sub>	2	8	14	6-2=4	14-2=12
P <sub>3</sub>	4	7	21	14-4=10	21-4=17
P <sub>4</sub>	5	3	24	21-5=16	24-5=19

LFJ = P<sub>2</sub> → P<sub>3</sub> → P<sub>1</sub> → P<sub>4</sub>



$$\text{Avg. WT} = \frac{0+4+10+16}{4} = \frac{30}{4} = 7.5$$

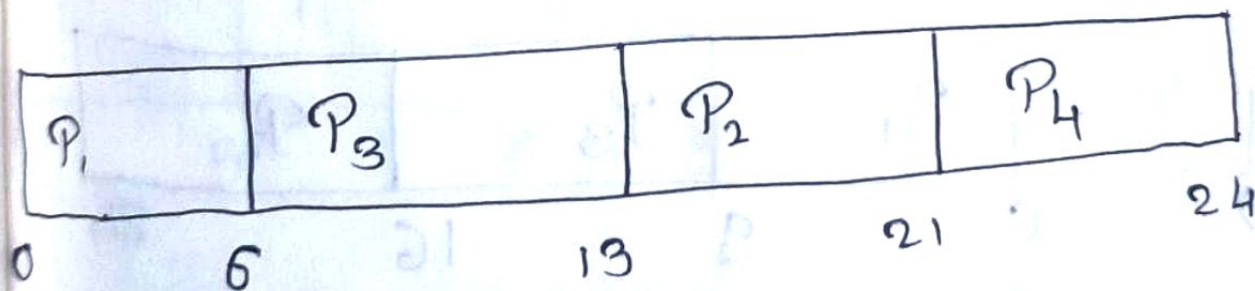
$$\text{Avg. TAT} = \frac{6+12+17+19}{4} = \frac{54}{4} = 13.5$$



#### 4. FCFS (Pre-emptive)

Process	AT	BT	P	WT	CT	TAT
P <sub>1</sub>	0	6	1	0	6	6
P <sub>2</sub>	2	8	3	11	<del>21</del>	19
P <sub>3</sub>	4	7	2	2	<del>13</del>	9
P <sub>4</sub>	5	3	4	16	24	19

Priority  $\rightarrow P_1 \rightarrow P_3 \rightarrow P_2 \rightarrow P_4$



$$\text{Avg. WT} = \frac{0 + 11 + 2 + 16}{4} = \frac{29}{4} = 7.25$$

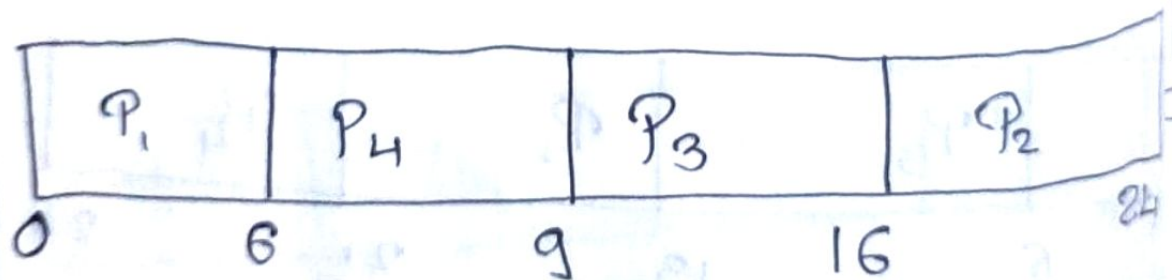
$$\text{Avg. TAT} = \frac{6 + 19 + 9 + 19}{4} = \frac{53}{4} = 13.25$$





# 5. SJF (Preemptive (Remaining Time))

Process	AT	BT	CT	WT	TAT
P <sub>1</sub>	0	6	6	0	6
P <sub>2</sub>	2	8	24	14	22
P <sub>3</sub>	4	7	16	5	12
P <sub>4</sub>	5	3	9	1	4



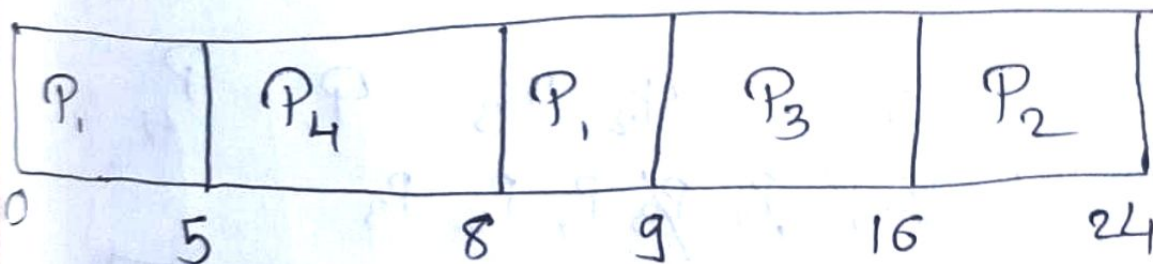
$$\text{Avg. WT} = \frac{0 + 14 + 5 + 1}{4} = \frac{20}{4} = 5$$

$$\text{Avg. TAT} = \frac{6 + 22 + 12 + 4}{4} = \frac{44}{4} = 11$$

6. SJF (Preemptive Normal).

Process	AT	BT	CT	WT	TAT
P <sub>1</sub>	0	<del>6</del> 4	9	<del>0+3+3</del> <del>0+8</del> 0	9
P <sub>2</sub>	2	8	24	14	22
P <sub>3</sub>	4	7	16	5	12
P <sub>4</sub>	5	3	8	0	3

SJF = P<sub>4</sub> P<sub>1</sub> P<sub>3</sub> P<sub>2</sub>



$$\text{Avg. WT} = \frac{3 + 14 + 5 + 0}{4} = \frac{22}{4} = 5.5$$

$$\text{Avg. TAT} = \frac{9 + 22 + 12 + 3}{4} = \frac{46}{4} = 11.5$$



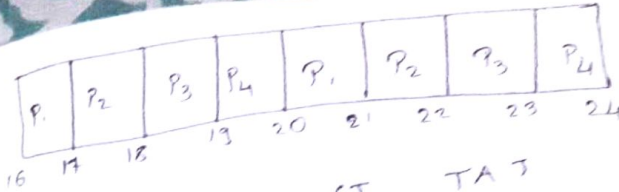
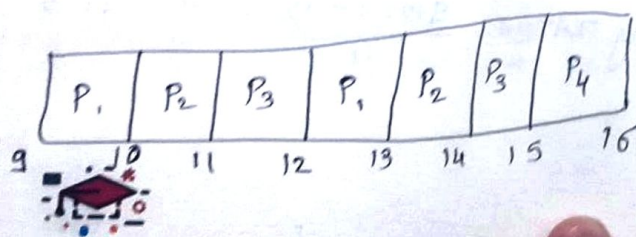
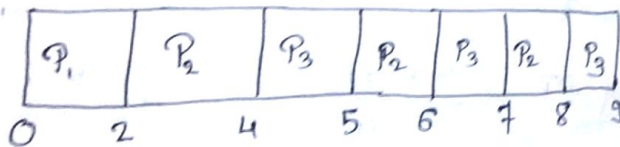


7 LTF (Pre-emptive)

Process AT BT

P<sub>1</sub> 0  
P<sub>2</sub> 2  
P<sub>3</sub> 4  
P<sub>4</sub> 5

LTF = P<sub>2</sub> P<sub>3</sub> P<sub>1</sub> P<sub>4</sub>



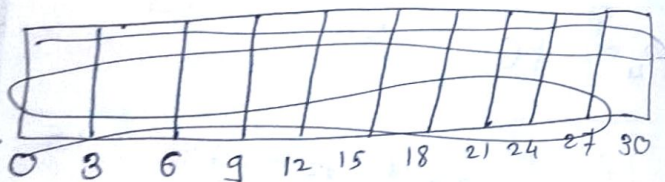
	WT	CT	TAT
P <sub>1</sub>	15	21	21
P <sub>2</sub>	12	22	20
P <sub>3</sub>	12	23	19
P <sub>4</sub>	16	24	19

WT for P<sub>1</sub> = 0 + 7 + 2 + 3 + 3 = 15  
 WT for P<sub>2</sub> = 0 + 1 + 1 + 2 + 2 + 3 + 3 = 12  
 WT for P<sub>3</sub> = 0 + 1 + 1 + 2 + 2 + 3 + 3 = 12  
 WT for P<sub>4</sub> = 10 + 8 + 3 = 16

e) Round Robin

Time quantum = 3

Process	AT	BT			
P <sub>1</sub>	0	21	<del>18</del>	<del>15</del>	<del>12</del>
P <sub>2</sub>	2	8			
P <sub>3</sub>	4	8			
P <sub>4</sub>	5	7			



P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	P <sub>1</sub>	P <sub>3</sub>	P <sub>1</sub>	P <sub>1</sub>	P <sub>1</sub>	P <sub>1</sub>
0	3	6	9	11	14	17	20	23	26

Process	CT	WT	TAT
P <sub>1</sub>	32	0+8+3=11	32
P <sub>2</sub>	6	1	4
P <sub>3</sub>	17	2+5=7	13
P <sub>4</sub>	11	4	6

$$\text{Avg WT} = \frac{11 + 1 + 7 + 4}{4} = \frac{23}{4} = 5.75$$

$$\text{Avg TAT} = \frac{32 + 4 + 13 + 6}{4} = \frac{55}{4} = 13.75$$