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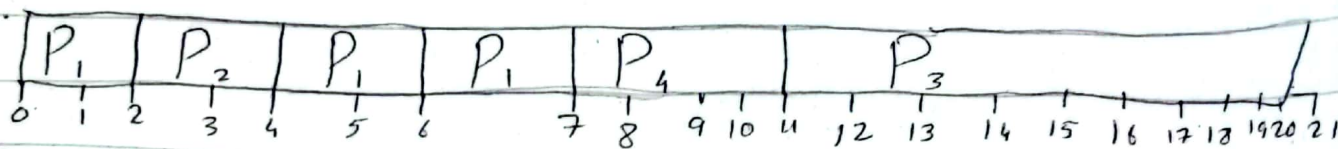
Reg No = 79290

Problem 9.1:

Process	Service	Arrival	Priority
P ₁	50	0	4
P ₂	20	20	1
P ₃	100	40	3
P ₄	40	60	2

Note: all times are in ms for diagrams, ~~10ms = 1~~
10 ms = 1 unit

a) SRT:



Remaining times at P_1 's arrival:

$$P_1 = 50$$

at P_2 's arrival:

$$P_1 = 30, P_2 = 20$$

at P_3 's arrival:

$$P_1 = 30, P_3 = 100$$

at P_4 's arrival:

$$P_1 = 10, P_3 = 100, P_4 = 40$$

at P_1 's completion:

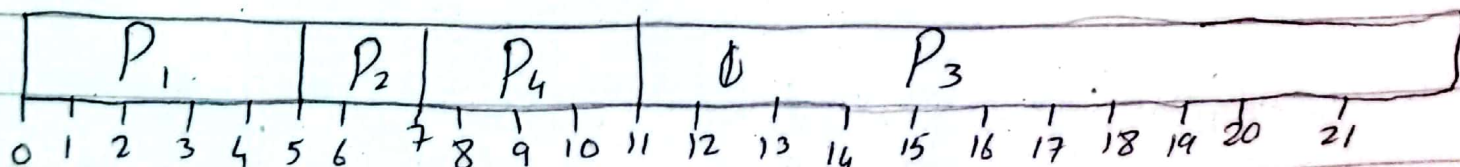
$$P_3 = 100, P_4 = 40$$

at P_4 's completion:

$$P_3 = 100$$

Finish	Wait (lat - Service)	Turnaround (Finish - arrival)	Normalized Tat (lat / Service time)
70	$70 - 50 = 20$	$70 - 0 = 70$	1.4
40	$20 - 20 = 0$	$40 - 20 = 20$	1
210	$170 - 100 = 70$	$210 - 40 = 170$	1.7
110	$50 - 40 = 10$	$110 - 60 = 50$	1.25

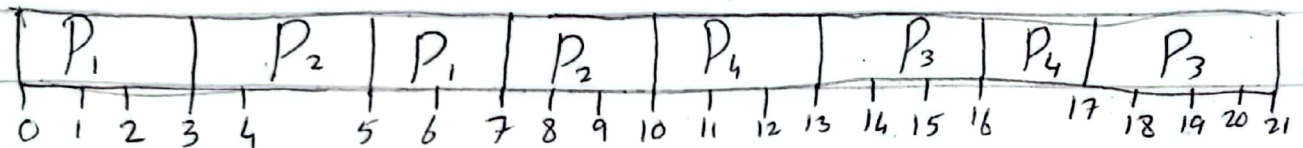
Non-Preemptive Priority:



Finish	Wait	Turnaround	Normalized T _{af}
50	50-50=0	50-0=50	1
70	50-20=30	70-20=50	2.5
210	170-100=70	210-40=170	1.7
110	50-40=10	110-60=50	1.25

* Round Robin:

Time quantum = 30ms



Queue: P₁ P₂ P₁ P₃ P₄ P₃ P₄ P₃

$$P_1 = 5/0 \quad 20 \quad 0$$

$$P_2 = 20 \quad 0$$

$$P_3 = 100 \quad 70 \quad 40 \quad 0$$

$$P_4 = 40 \quad 10 \quad 0$$

Finish	Wait	Turnaround	Normalized T _{af}
70	70-50=20	70-0=70	1.4
50	30-20=10	50-20=30	1.5
210	170-100=70	210-40=170	1.7
170	110-40=70	170-60=110	2.75

b) Average Waiting times.

$$SRT = \frac{20+0+70+10}{4} = 25ms$$

$$Priority = \frac{0+30+70+10}{4} = 27.5ms$$

$$RoundRobin = \frac{20+10+70+70}{4} = 42.5ms$$

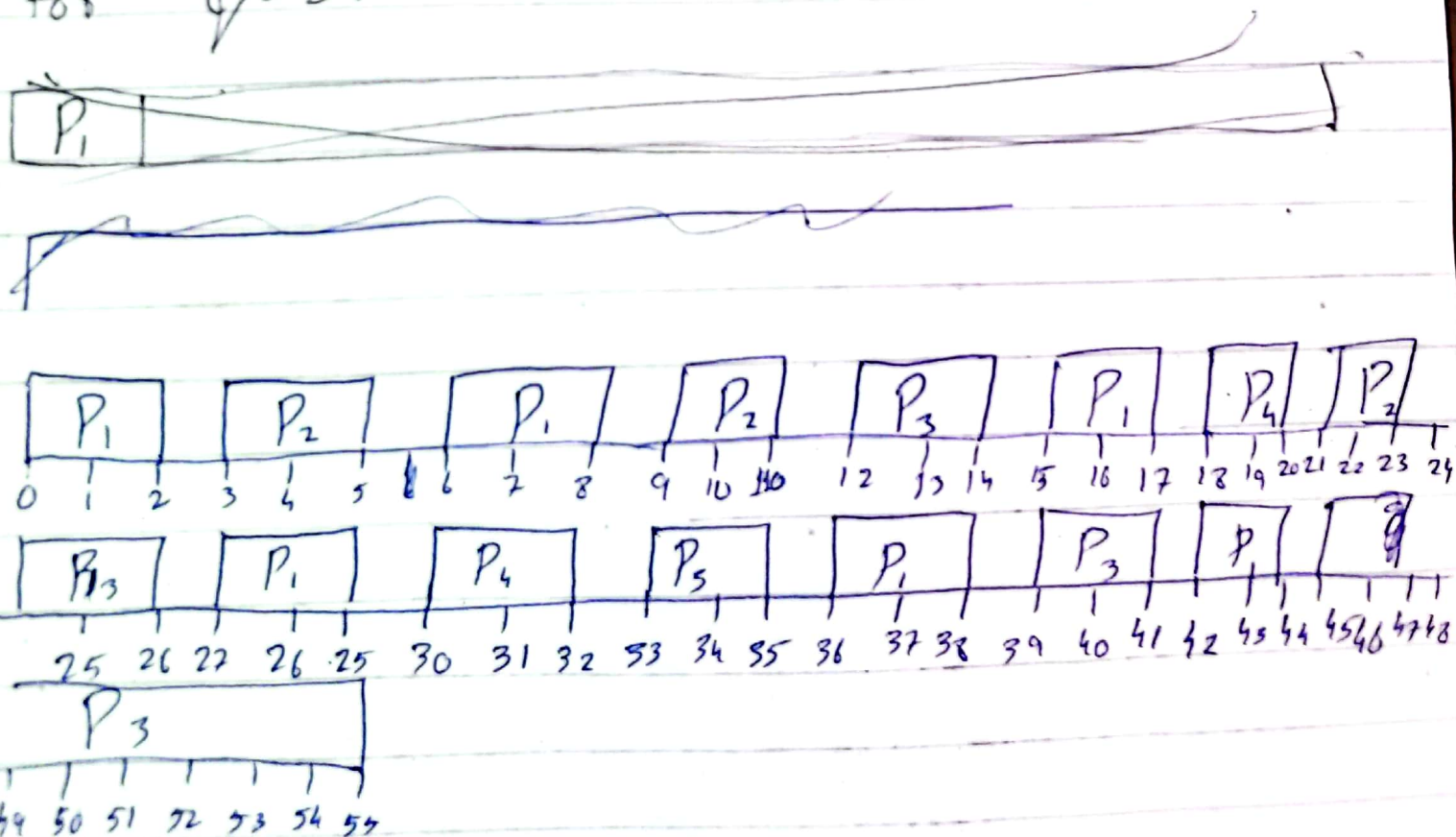
Problem 9.2)

The factors that should be considered in determining the time quantum in a round robin are as follows:

- Throughput
- Turnaround Time
- Waiting Time

Process	Arrival	Service
P_1	0	12
P_2	2	6
P_3	8	18
P_4	10	4

For $q = 2$:



Queue: $P_1 P_2 P_1 P_2 P_3 P_1 P_4 P_2 P_3 P_1 P_4 P_3 P_1$
 $P_3 P_1 P_3$

$P_1 = 12 \ 10 \ 8 \ 6 \ 4 \ 2 \ 0$

$P_2 = 6 \ 4 \ 2 \ 0$

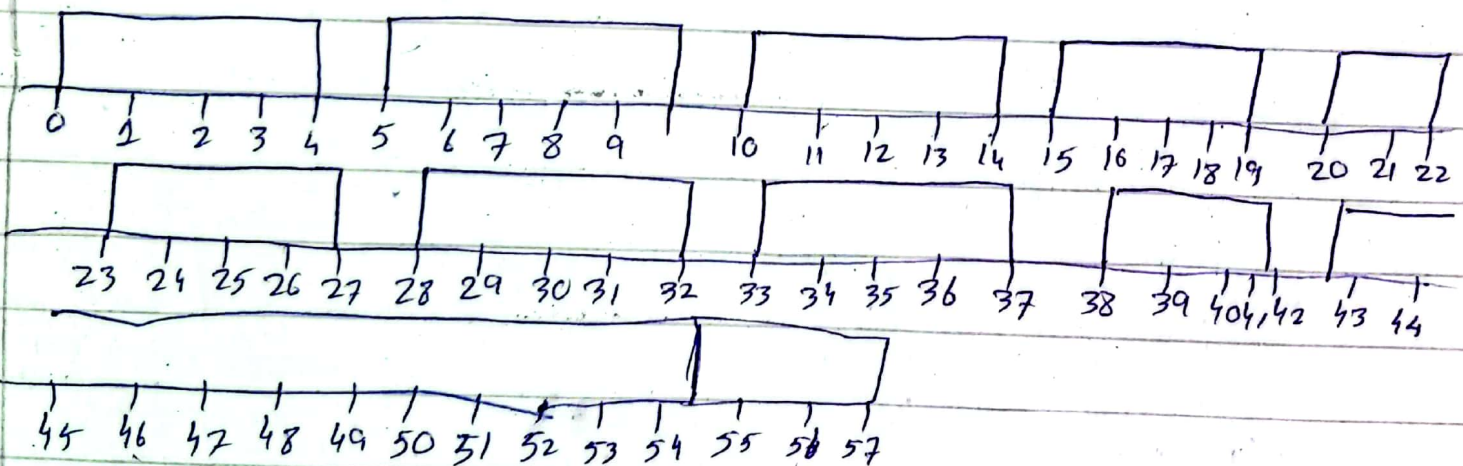
$P_3 = 18 \ 16 \ 14 \ 12 \ 10 \ 8 \ 6 \ 4 \ 2 \ 0$

$P_4 = 4 \ 2 \ 0$

Finish	Arrival	Turn around
44	0	44
23	2	21
55	8	47
32	10	22

$$\text{Mean} = \frac{134}{4} = 33.5$$

For $q=4$:



Queue: $P_1 P_2 P_1 P_3 P_2 P_4 P_1 P_3 P_1 P_3$

$P_1 = 12 \ 8 \ 4 \ 0$

$P_2 = 6 \ 2 \ 0$

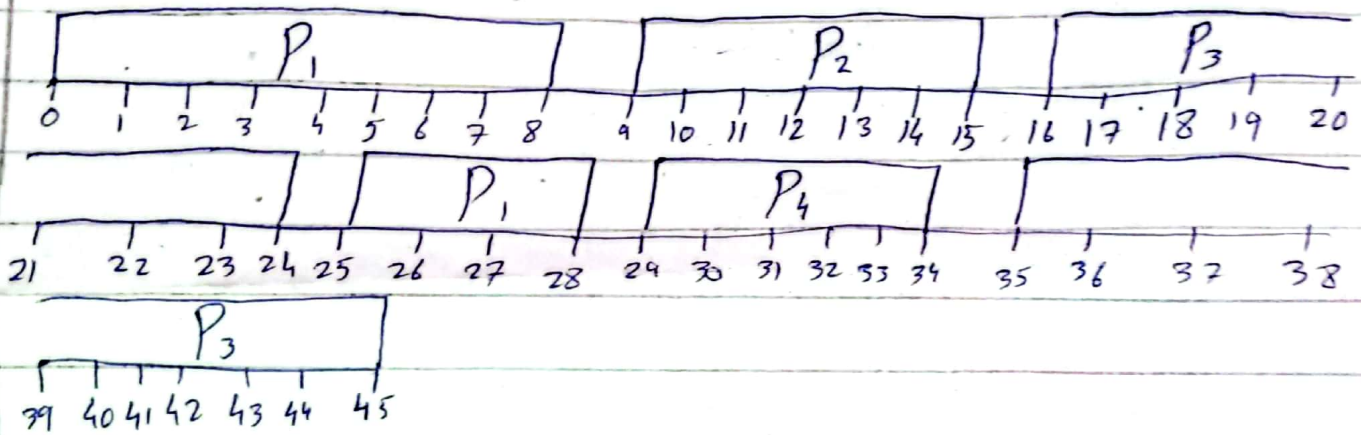
$P_3 = 18 \ 14 \ 0$

$P_4 = 4 \ 0$

Finish	Arrival	Turnaround
42	0	42
22	2	20
57	8	49
27	10	17

$$\text{Mean} = \frac{122}{4} = 32$$

For $q_1 = 8$:



Queue = ~~P1~~ ~~P2~~ ~~P3~~ ~~P1~~ ~~P4~~ ~~P3~~

P1	12	4	0
P2	6	0	
P3	18	10	0
P4	4	0	

Finish	Arrival	Turnaround
29	0	29
15	2	13
45	8	37
34	10	24

$$\text{Mean} = \frac{103}{4} = 25.75$$