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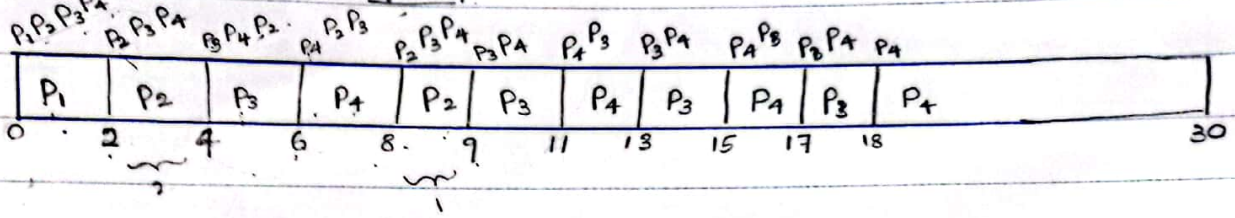
Operating System : CPU scheduling Algorithms

Question 01

01)

Process	BT
P1	2
P2	3
P3	7
P4	18

q = 2



$P_1 = (0 - 0) = 0$

$P_2 = (2 - 0) + (8 - 4) = 6$

$P_3 = (4 - 0) + (9 - 6) + (13 - 11) + (17 - 15) = 11$

$P_4 = (6 - 0) + (11 - 8) + (15 - 13) + (18 - 17) = 12$

average waiting time $= (0 + 6 + 11 + 12)/4 = 29/4$

$= 7.25$

Turnaround time.

$P_1 = 2 - 0 = 2$

$P_2 = 9 - 0 = 9$

$P_3 = 18 - 0 = 18$

$P_4 = 30 - 0 = 30$

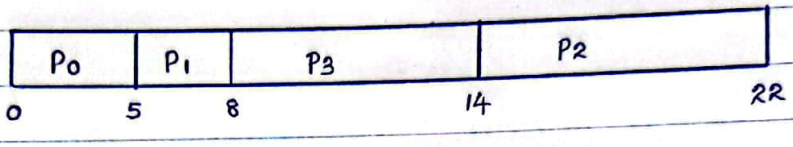
A. Turnaround Time : $(2 + 9 + 18 + 30)/4$

$= 14.75$

No. Date

Question 02

Process	Arrival Time	Execution Time	Service Time
P_0	0	5	0
P_1	1	3	5
P_2	2	8	14
P_3	3	6	8



Waiting Time

$P_0 = 5 - 0 = 5$

$P_1 = 14 - 1 = 13$

$P_2 = 8 - 2 = 6$

$P_3 =$

Waiting Time

$P_0 = 0 - 0 = 0$

$P_1 = 5 - 1 = 4$

$P_2 = 14 - 2 = 12$

$P_3 = 8 - 3 = 5$

Average Waiting Time = $(0+4+12+5)/4$

$= 21/4$ //

Turnaround Time WT + BT

$P_0 = 0 + 5 = 5$

$P_1 = 4 + 3 = 7$

$P_2 = 12 + 8 = 20$

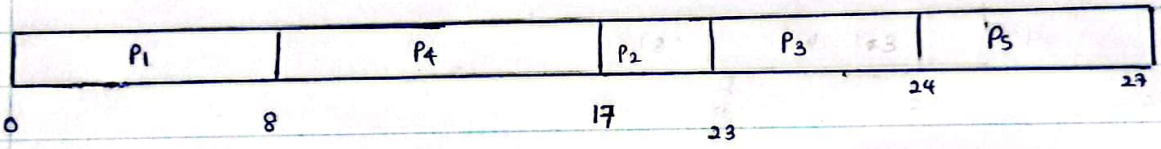
$P_3 = 5 + 6 = 11$

Average Turnaround Time = $(5+7+20+11)/4$

$= 43/4$ //

Draw the Gantt chart for FCFS scheduling and for Round Robin (1ms Quantum). Then calculate the average waiting time and average turnaround time for both scheduling methods.

Process	Burst	Priority	Arrival Time
P_1	8 1	4	0
P_2	6 4	1	2
P_3	1 3	2	2
P_4	9 2	2	1
P_5	3 5	3	3



Waiting Time.

$P_1 = 0 - 0 = 0$

$P_2 = 17 - 2 = 15$

$P_3 = 23 - 2 = 21$

$P_4 = 8 - 1 = 7$

$P_5 = 24 - 3 = 21$

Average Waiting Time $= \frac{(0 + 15 + 21 + 7 + 21)}{5}$

$= 64/5$

$= 12.8$

Average Turnaround Time

$P_1 = 8 - 0 = 8$

$P_2 = 23 - 2 = 21$

$P_3 = 24 - 2 = 22$

$P_4 = 17 - 1 = 16$

$P_5 = 27 - 3 = 24$

Average Turnaround Time $= \frac{(8 + 21 + 22 + 16 + 24)}{5}$

$= 91/5$

$= 18.2$

Question 04

04)

Time (ms)	0	1	5	14	23	32	41	50
Execution	P_0	P_1	P_1	P_2	P_0	P_0	P_0	P_0

WT (Waiting Time)

WT P_0 = (0-0) + (23-1) = 22 ms //

WT P_1 = (1-1) = 0 ms //

WT P_2 = (14-2) = 12 ms //

Average Waiting Time = (22 + 0 + 12) ms / 3

= 34 ms / 3

= 11.3 ms //