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Assignment - 1 ↔ OS

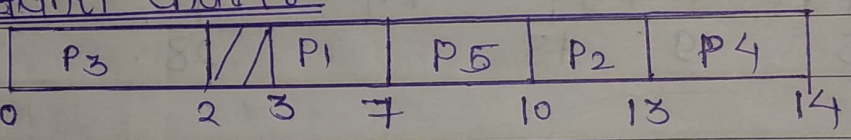
Problem - 01.

Consider the set of 5 processes whose arrival time and burst time are given below.

Process Id	Arrival time	Burst time
P1	3	4
P2	5	3
P3	0	2
P4	5	1
P5	4	3

If the CPU scheduling policy is FCFS, calculate the average waiting time and average turn around time.

Gantt chart:



Process	Waiting Time (W.T) Start time - arrival T	Turn around time CUT + T CPU (burst T)
P1	3 - 3 = 0	0 + 4 = 4
P2	10 - 5 = 5	5 + 3 = 8
P3	0 - 0 = 0	0 + 2 = 2
P4	13 - 5 = 8	8 + 1 = 9
P5	7 - 4 = 3	3 + 3 = 6

1) Average W.T. = $\frac{0+5+0+8+3}{5} = \frac{16}{5} = 3.2$ unit

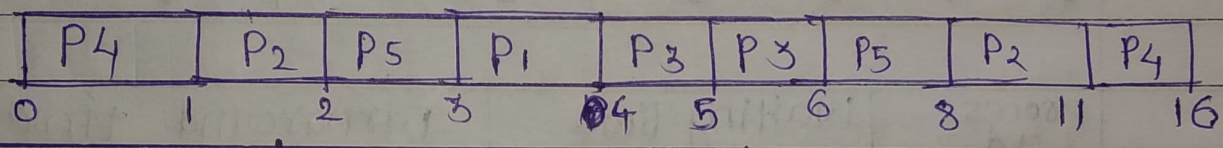
2) Turn around time average = $\frac{4+8+2+9+6}{5} = \frac{29}{5} = 5.8$ Unit

Problem - 02

Consider the set of 5 processes whose arrival time and burst time are given below -

Process Id	Arrival time	Burst time.
P_1	3	$1 - x$
P_2	1	$4 \rightarrow 3$
P_3	4	$2 \rightarrow 1$
P_4	0	$6 \rightarrow 5$
P_5	2	$3 \rightarrow 2$

If the CPU scheduling policy of SJF preemtive, calculate the average waiting time and average turn around time.



Process Id	Waiting Time	Turnaround time.
P_1	$4-3=1$	$1-1=0$
P_2	$11-1=10$	$10-4=6$
P_3	$6-4=2$	$2-2=0$
P_4	$16-0=16$	$16-6=10$
P_5	$8-2=6$.	$6-3=3$.

$$A.W.T = \frac{1+10+2+16+6}{5} = 7 \text{ unit}$$

$$A.T.A.T = \frac{0+6+0+10+3}{5} = 3.8 \text{ unit}$$

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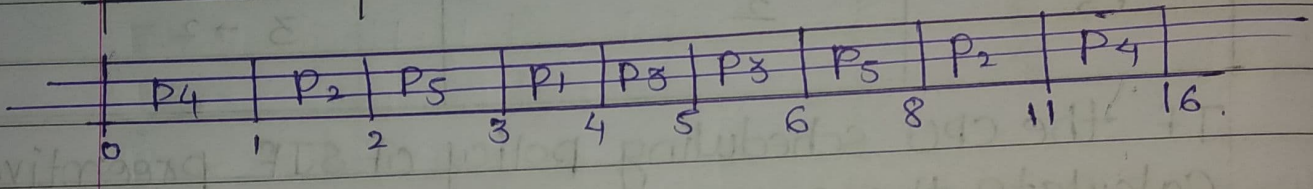
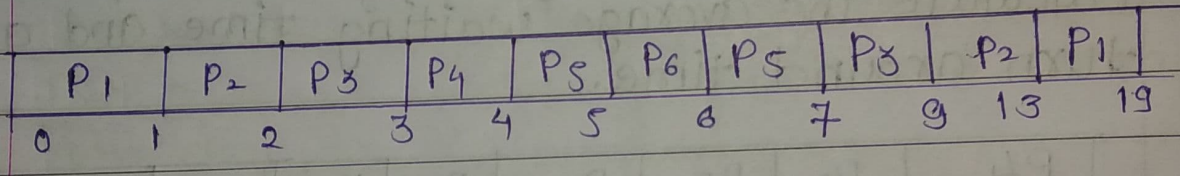
Problem - 3

Q.3)

Process Id	Arrival Time	Burst Time.
P_1	0	7
P_2	1	5
P_3	2	3
P_4	3	1
P_5	4	2
P_6	5	1





Process Id	Waiting Time.	Turnaround time.
P_1	19 - 7 = 12	19 - 0 = 19
P_2	12 - 5 = 7	13 - 1 = 12
P_3	7 - 3 = 4	9 - 2 = 7
P_4	1 - 1 = 0	4 - 3 = 1
P_5	3 - 2 = 1	7 - 4 = 3
P_6	1 - 1 = 0	6 - 5 = 1

1) $A.W.T = \frac{12+7+4+0+1+0}{6}$

* $A.W.T = 4$ Unit.

2) $A.T.A.T = \frac{19+12+7+1+3+1}{6}$

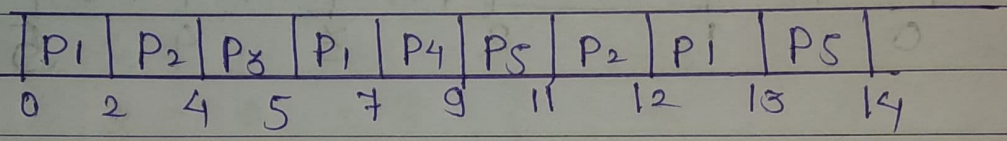
$A.T.A.T. = 7.16$. unit

Problem - 4

Q.4)

Process Id	Arrival time	Burst time
P_1	0	5
P_2	1	3
P_3	2	1
P_4	3	2
P_5	4	3

Gantt chart ⇒



Process Id	Turnaround time	Waiting time.
P_1	13-0 = 13	13-5 = 8
P_2	12-1 = 11	11-3 = 8
P_3	5-2 = 3	3-1 = 2
P_4	9-3 = 6	6-2 = 4
P_5	14-4 = 10	10-3 = 7

(1) Average waiting time $= \frac{8+8+2+4+7}{5}$

A.W.T = 5.8 Unit

Average turn. A.T $= \frac{13+11+3+6+10}{5}$

A.T.A.T = 8.6 Unit