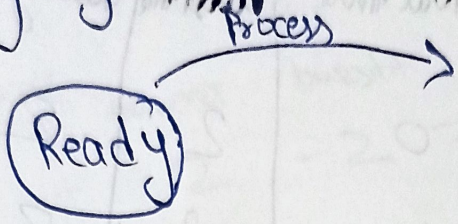
DBMS

JAVA

9/6/21
9:30
10:30

operating System

① Seduling Algorithm :



② Primitive – breaking while Exicuting (stopping)
(Process बीच में रुका जाता है)

③ Non-primitive – Exicute fully to terminat
(Process पूरा Exicute होता है तभी Terminate होता है)

primitive part

Time for Numerical :–

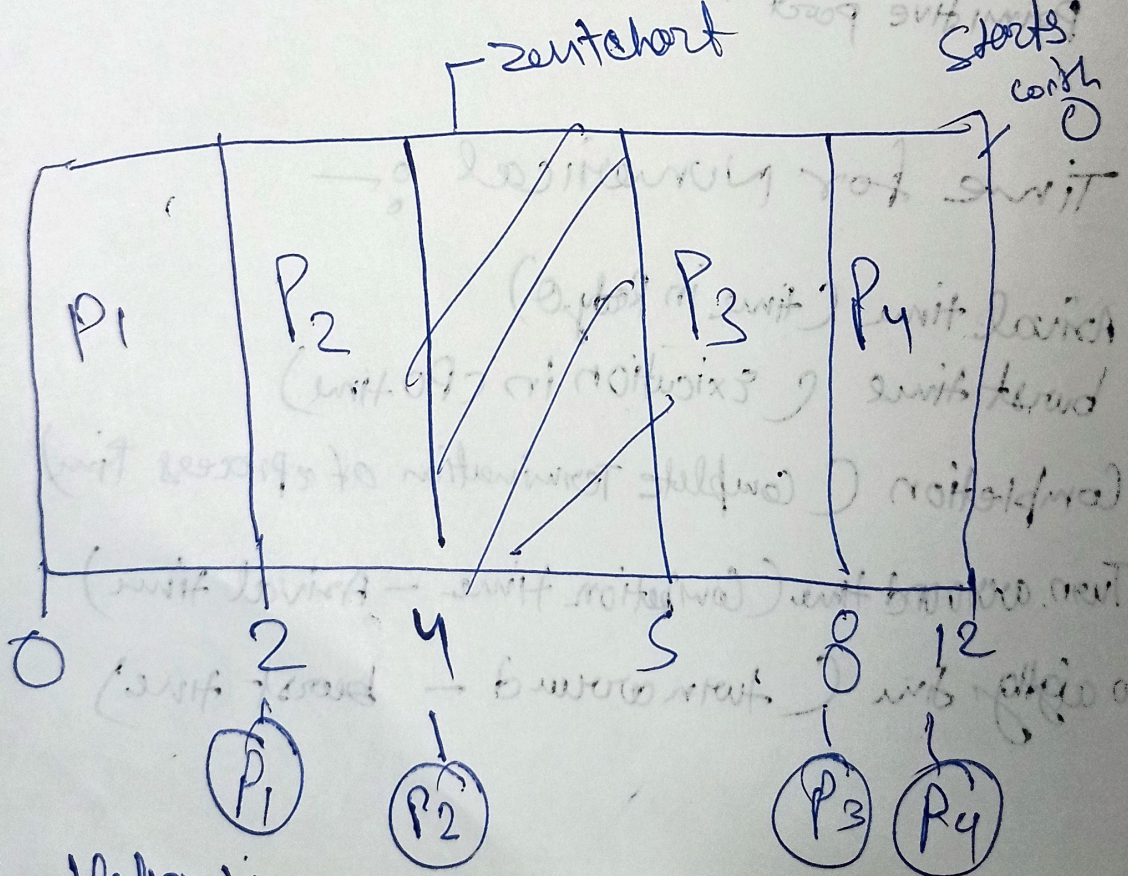
- Arival time (time in Ready Q)
- burst time (Exicution in CPU time)
- Completion (Complete Termination of a process Time)
- Turn around time (Completion time – Arival time)
- waiting time (turn around – burst time)

(2) Mod

1

(07) Gantt chart of Non-preemptive

Process No	Arrival time	burst time	starting time	turn arnd.	wai ting
P_1	0	2	2		0
P_2	1	2	3		1
P_3	5	3	3		0
P_4	6	4	6		2



Completion time

Turn around time:- 9988-67993

$P_1 = 2-0 = 2$

$P_2 = 4-1 = 3$

$P_3 = 8-5 = 3$

$P_4 = 12-6 = 6$

waiting time

$P_1 = 2-2 = 0$

$P_2 = 3-2 = 1$

$P_2 = 3-3 = 0$

$P_4 = 6-4 = 2$

Average turn around time

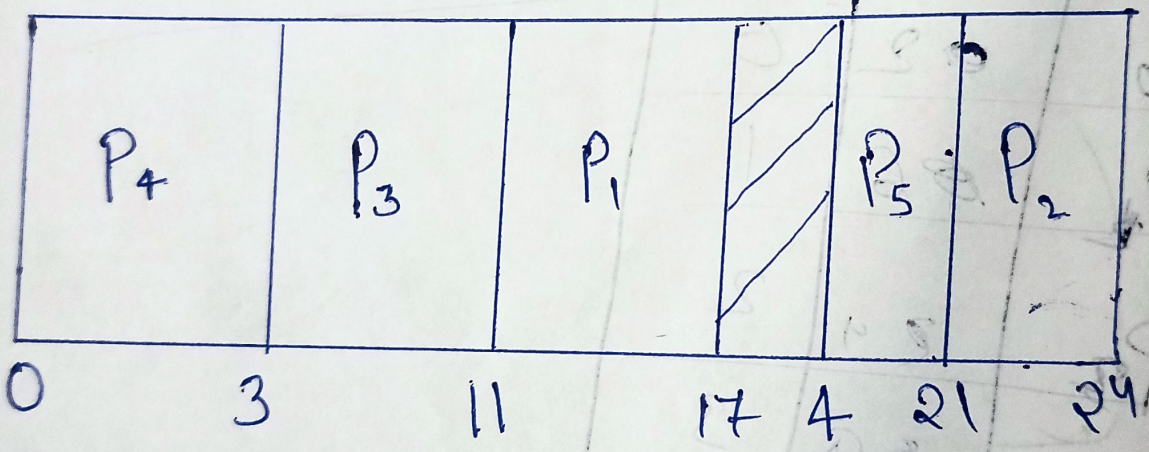
$2+3+3+6 \div 4 = 3.5$

Average waiting time

$0+1+0+2 = 0.4$

Question - 1

P. Id	Arival time	burst time	turn. acc. to w. time	Av.	Av.
P_1	2	6			
P_2	5	3			
P_3	1	8			
P_4	0	3			
P_5	4	4			

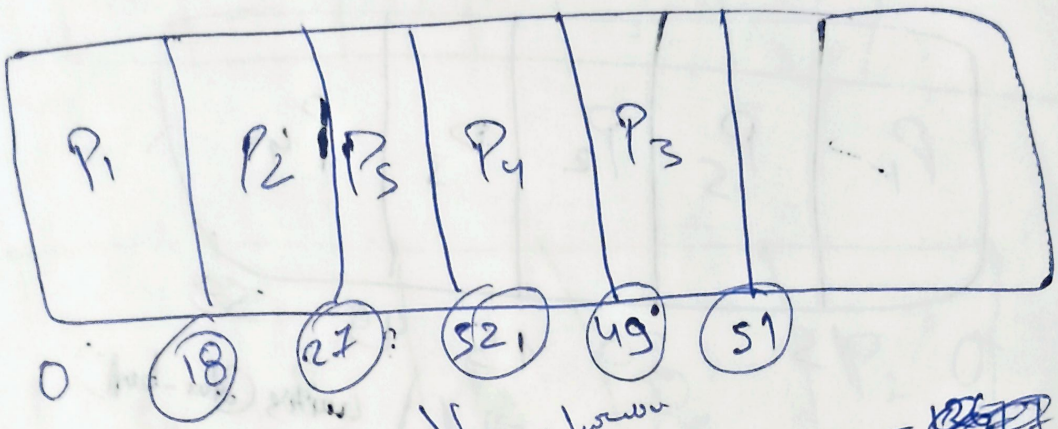


	arrival	burst time	Compl time	turn A. time	wait time
P_1	0	18	18	18	0
P_2	4	9	27	23	14
P_3	11	2	51	40	38
P_4	10	17	49	39	22
P_5	8	5	32	24	19

51
11
40

23
9
14

39
17
22



turn arr. (Comp - Arrival)

$P_1 = 18 - 0 = 18$

$P_2 = 27 - 4 = 23$

$P_3 = 51 - 11 = 40$

$P_4 = 49 - 10 = 39$

$P_5 = 32 - 8 = 24$

waiting (turnaro - burst t.)

$P_1 = 18 - 18 = 0$

$P_2 = 23 - 9 = 14$

$P_3 = 40 - 2 = 38$

$P_4 = 39 - 17 = 22$

$P_5 = 24 - 5 = 19$

av. turnaro

$18 + 23 + 40 + 39 + 24 = 144$

$144 / 5 = 28.8$

av. wait

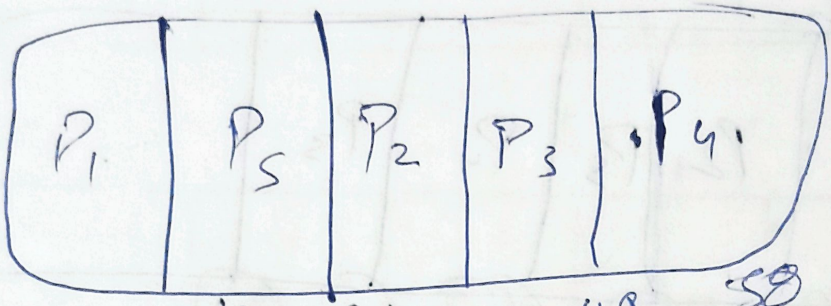
$0 + 14 + 38 + 22 + 19 = 93$

$93 / 5 = 18.6$

fully add first & then divide 5

ID	Arr	burst	Comp	turn	wait	Ans
P_1	0	15	15	15	0	15
P_2	6	15	45	39	24	39
P_3	6	4	49	43	39	43
P_4	11	9	58	47	37	47
P_5	4	15	30	26	11	26

39
15
24



turn arr (Comple − Arrival) waiting (turn − burst)

$P_1 = 15 - 0 = 15$ | $P_1 = 15 - 15 = 0$

$P_2 = 45 - 6 = 39$ | $P_2 = 39 - 15 = 24$

$P_3 = 49 - 6 = 43$ | $P_3 = 43 - 4 = 39$

$P_4 = 58 - 11 = 47$ | $P_4 = 47 - 9 = 37$

$P_5 = 30 - 4 = 26$ | $P_5 = 26 - 15 = 11$

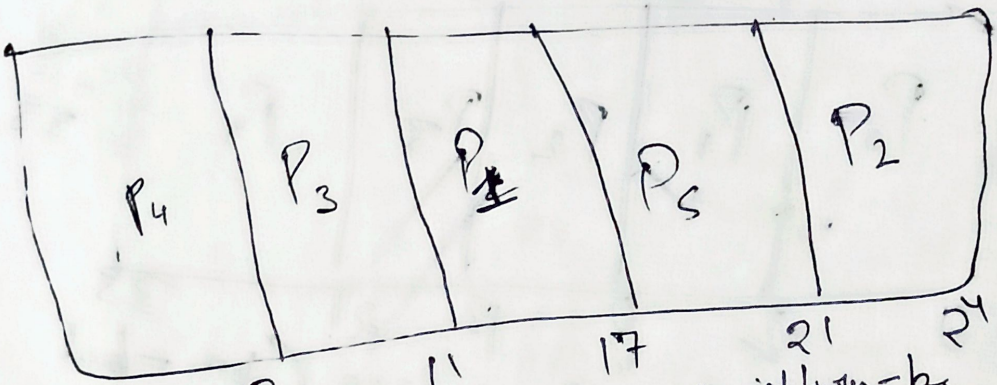
Av. turn
$\frac{15 + 39 + 43 + 47 + 26}{5} = 34$

Av. waiting
$\frac{0 + 24 + 39 + 37 + 11}{5} = 22.2$

1.8
5 | 59
5
40
40
2
5 | 30 | 6
30
24

Q.1 of 07

ID	Arv.	burst	Comp.	turn A.	waiti.
P_1	2	6	17	15	9
P_2	5	3	24	19	16
P_3	1	8	11	10	2
P_4	0	3	3	3	0
P_5	4	4	21	27	23
				54	30



turn Arr. (Comp. − Ai)

$P_1 = 17 - 2 = 15$

$P_2 = 24 - 5 = 19$

$P_3 = 11 - 1 = 10$

P_4 3 − 0 = 3

P_5 = 21 − 4 = 27

Av. turn = 1.8

Av. waiting = 6

waiti. (turn − b.

$P_1 = 15 - 6 = 9$

P_2 19 − 3 = 16

$P_3 = 10 - 8 = 2$

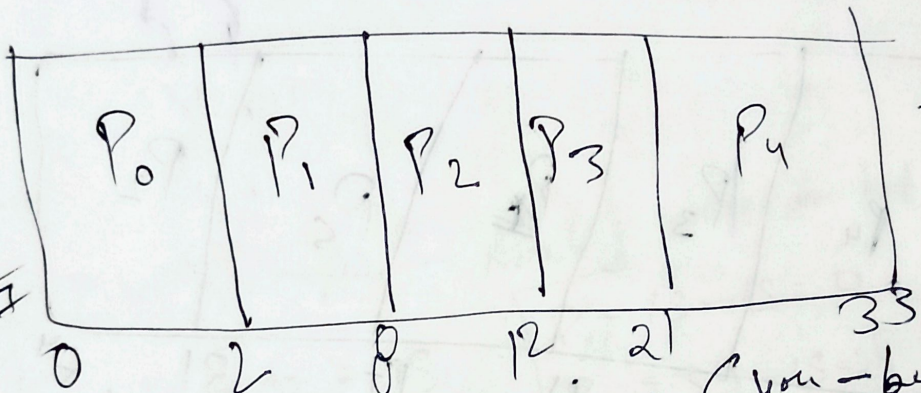
P_4 3 − 3 = 0

$P_5 = 27 - 4 = 23$

Practice - 2

IP	At	Bt	Comp.	Turn.	Wait
P_0	0	2	2	2	0
P_1	1	6	8	7	1
P_2	2	4	12	10	8
P_3	3	9	21	18	15
P_4	4	12	33	29	17

66



Turn Arr. (comp - Ar)

P_0 2 - 0 = 2
P_1 8 - 1 = 7
P_2 12 - 2 = 10
P_3 21 - 3 = 18
P_4 33 - 4 = 29

Waiting time (Turn - Bt)

P_0 2 - 2 = 0
P_1 7 - 6 = 1
P_2 10 - 2 = 8
P_3 18 - 9 = 15
P_4 29 - 4 = 23

Av. turn Arr. $66 = 13.2$

Av. waiting = 7.5

turn Ar. (Comp - Ar)

$P_0 = 2-0 = 2$

$P_1 = 8-1 = 7$

$P_2 = 12-2 = 10$

$P_3 = 21-3 = 18$

$P_4 = 33-4 = 29$

Av turn = 66 % 5

$$5\overline{)66}\,(13.2$$

$$\begin{array}{r} -5 \\ \hline 16 \\ -15 \\ \hline 10 \\ 10 \\ \hline 0 \end{array}$$

wait'g (tur - burst)

$P_0 = 2-2 = 0$

$P_1 = 7-6 = 1$

$P_2 = 10-4 = 6$

$P_3 = 18-9 = 9$

$P_4 = 29-12 = 17$

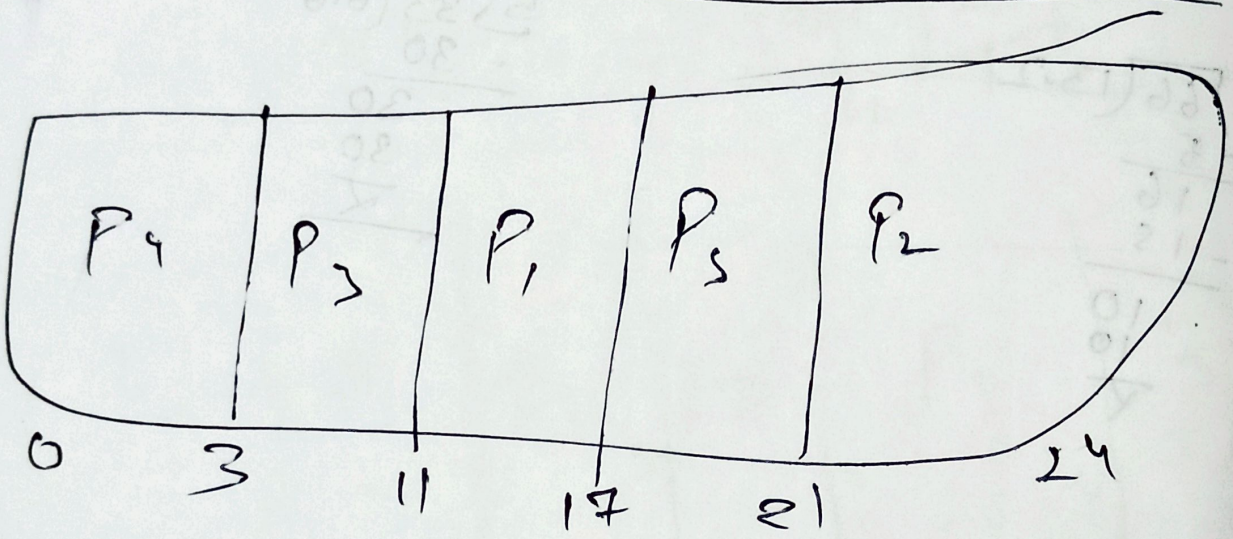
Av. wait'g = 33 % 5

$$5\overline{)33}\,6.6$$

$$\begin{array}{r} -30 \\ \hline 30 \\ 30 \\ \hline 0 \end{array}$$

Question - 1

PID	A	Bt	Cm	Turn
P_1	2	6	3	1
P_2	5	3	11	6
P_3	1	8	17	16
P_4	0	3	21	21
P_5	4	4	24	20



Turn around :- (Comp - At)

$P_1 = 3 - 2 = 1$

$P_2 = 11 - 5 = 6$

$P_3 = 17 - 1 = 16$

$P_4 = 21 - 0 = 21$

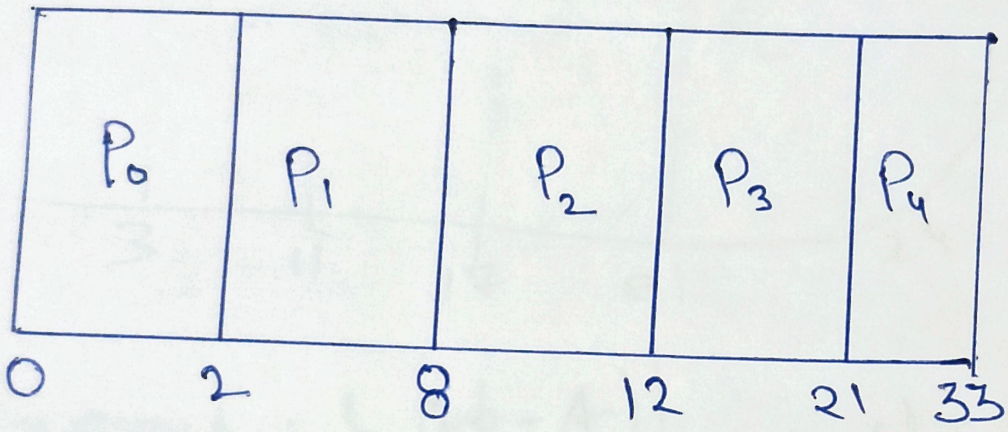
$P_5 = 24 - 4 = 20$

waiting (Turn - Burst)

$P_1 = 1 - 6$

Question -2

P.ID	A.T.	B.t.	C.T	T.A.T	W.T.
P_0	0	2	2	2	0
P_1	1	6	8	7	1
P_2	2	4	12	10	6
P_3	3	9	21	18	9
P_4	4	12	33	29	17



Turn Around [Complition - Arival Time]

$P_0 = 2 - 0 = 2$

$P_1 = 8 - 1 = 7$

$P_2 = 12 - 2 = 10$

$P_3 = 21 - 3 = 18$

$P_4 = 33 - 4 = 29$

WAITING Time [Turn Around – Busted Time]

$P_0 = 2 - 2 = 0$

$P_1 = 7 - 6 = 1$

$P_2 = 10 - 4 = 6$

$P_3 = 18 - 9 = 9$

$P_4 = 29 - 12 = 17$

Average Turn Around Time :-

$2 + 7 + 10 + 18 + 29 = 66$

$66 \% 5 = 13.2$

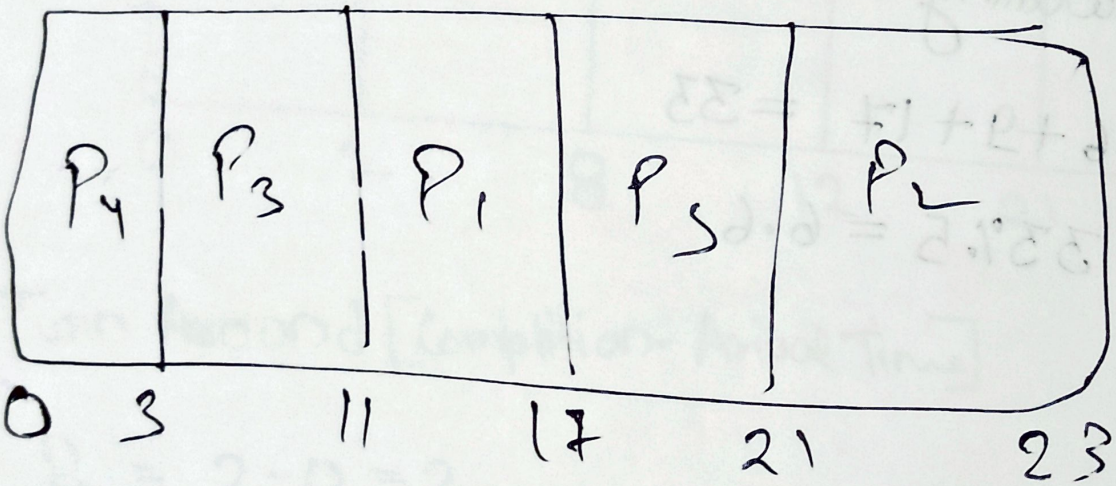
Average waiting time :-

$0 + 1 + 6 + 9 + 17 = 33$

$33 \% 5 = 6.6$

Shortest Job First (SJF) burst time short

P.I	A.T	B.T	C.T	T.A.T	W.T
P_1	2	6	03	1	
P_2	5	2	09	4	
P_3	1	8	11	10	
P_4	0	3	15	15	
P_5	4	4	23	19	



Form A. (Con-A)

$P_1 = 3-2 = 1$

$P_2 = 9-5 = 4$

$P_3 = 11-1 = 10$

$P_4 = 15-0 = 15$

$P_5 = 23-4 = 19$

Wait (tw - bw)

$P_1 = 1-6$

P - 1 2 3 4 5

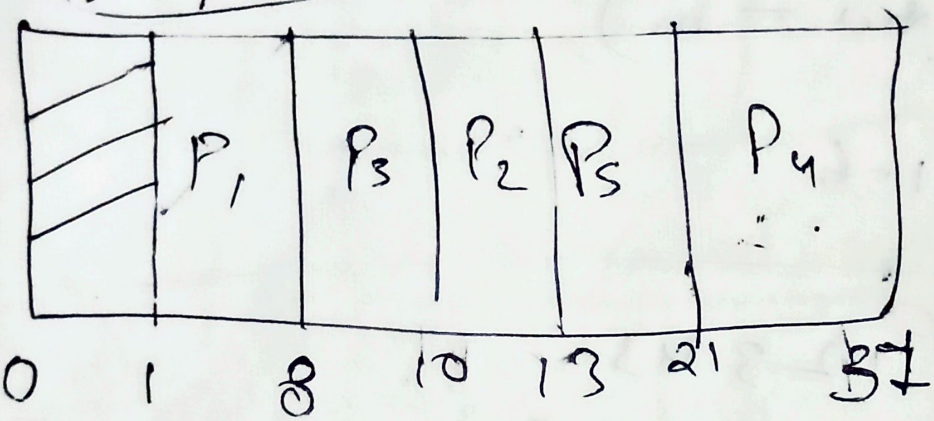
A - 1, 3, 6, 7, 9

B - 7, 3, 2, 10, 8

operating System

	A	B	C	TA	WT
P_1	1	7	8	7	0
P_2	3	9	13	10	7
P_3	6	2	10	4	2
P_4	7	10	31	24	14
P_5	9	8	21	12	4

~~P_1 P_2 P_3 P_4 P_5~~



Gen – A

$P_1 = 8 - 1 = 7$

$P_2 = 13 = 10$

$P_3 = 10 - 6 = 4$

$P_5 = 31 - 7 = 24$

$P_{25} = 21 - 9 = 12$

wait two - bx

$P_0 - 7-7 = 0$

$P_2 = 10 - 3 = 7$

$P_3 = 4 - 2 = 2$

$P_4 - 24 - 10 = 14$

$P_5 = 12 - 4$

Ans

tw = 11.4

wt = 5.4

2, 12, 6, 21, 33

	A	B	C	tw
P_0	0	2	2	
P_1	1	6	8	
P_2	2	4	12	
P_3	3	9	21	
P_4	4	12	33	

12
+21
33

~~P_0 P_1~~ P_2 P_3 P_4

P_0	P_1	P_2	P_3	P_4	

0 2 8 12 21 33

DBMS

JAVA

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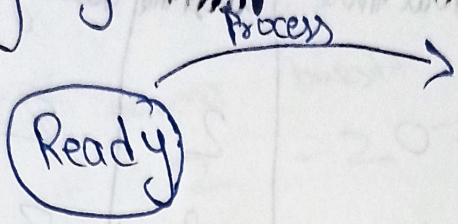
operating System

① Seduling Algorithm :



② Primitive – breaking while Exicuting (stopping)
(Process बीच में रुका जाता है)

③ Non-primitive – Exicute fully to terminat
(Process पूरा Exicute होता है तभी Terminate होता है)

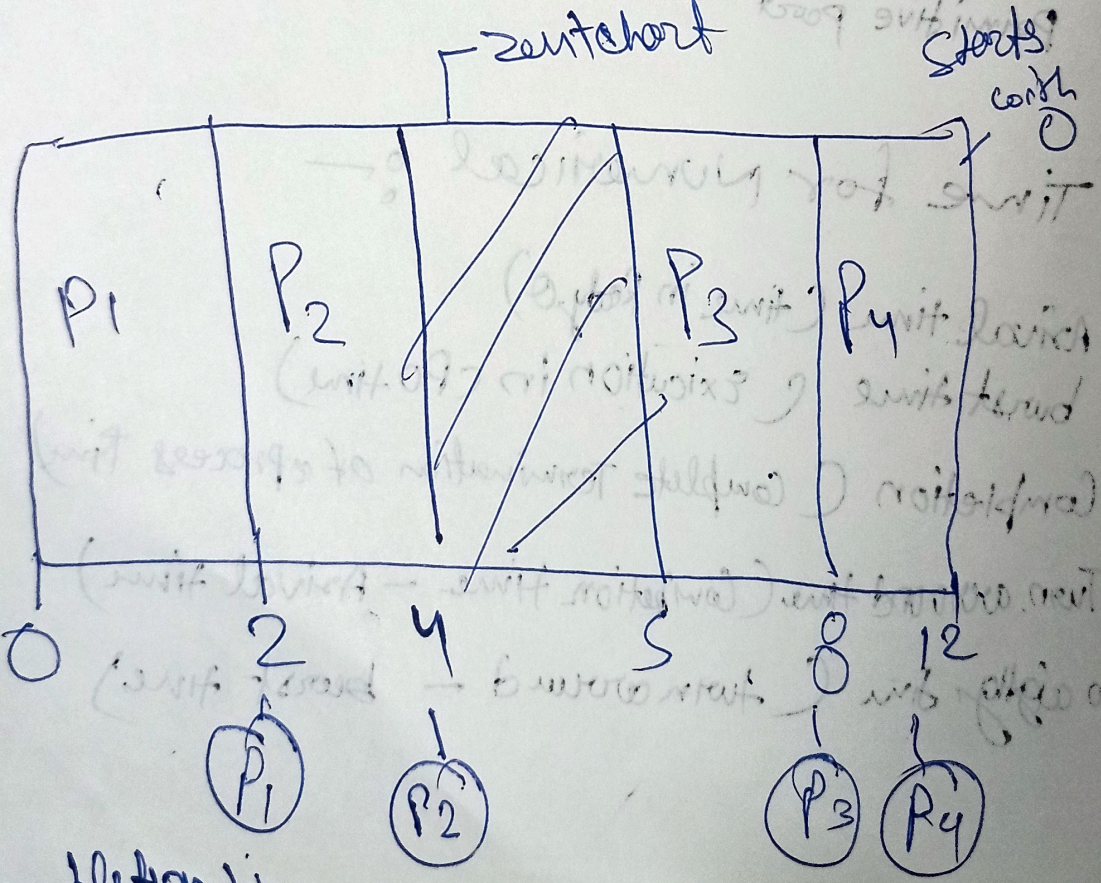
primitive part

Time for Numerical :–

- Arival time (time in Ready Q)
- burst time (Exicution in CPU time)
- Completion (Complete Termination of a process Time)
- Turn around time (Completion time – Arival time)
- waiting time (turn around – burst time)

Gantt chart of Non-preemptive

Process No	Arrival time	burst time	starting time	waiting time
P_1	0	2	2	0
P_2	1	2	3	1
P_3	5	3	8	0
P_4	6	4	6	2



completion time

Turn around time:- 9988-67993

$P_1 = 2-0 = 2$

$P_2 = 4-1 = 3$

$P_3 = 8-5 = 3$

$P_4 = 12-6 = 6$

waiting time ~~burst~~ time — turnaround — burst

$P_1 = 2-2 = 0$

$P_2 = 3-2 = 1$

$P_2 = 3-3 = 0$

$P_4 = 6-4 = 2$

Average turn around time

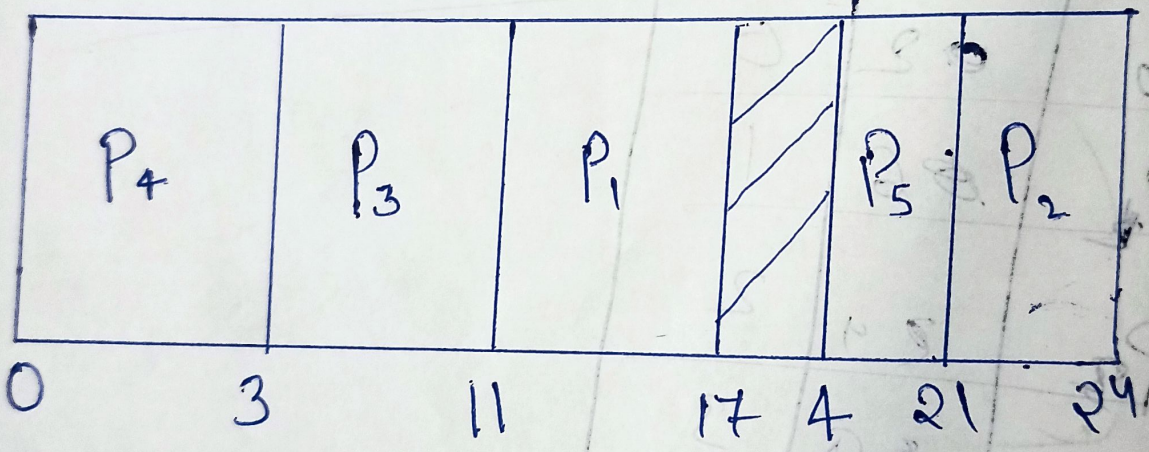
$2+3+3+6 / 4 = 3.5$

Average waiting time

$0+1+0+2 = 0.4$

Question - 1

P. Id	Arival time	burst time	turn. acc. to w. time	Av.	Av.
P_1	2	6			
P_2	5	3			
P_3	1	8			
P_4	0	3			
P_5	4	4			

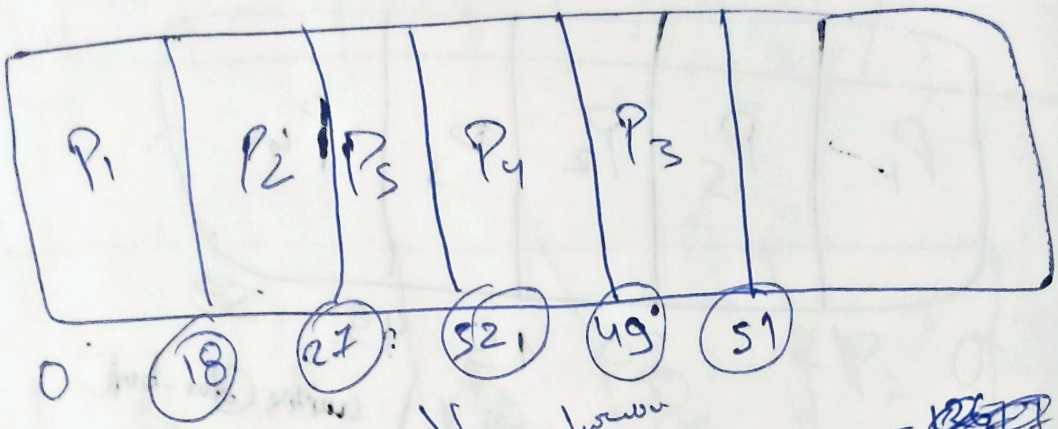


	arrival	burst time	Compl time	turn A. time	wait time
P_1	0	18	18	18	0
P_2	4	9	27	23	14
P_3	11	2	51	40	38
P_4	10	17	49	39	22
P_5	8	5	32	24	19

51
11
40

23
9
14

39
17
22



turn arr. (Comp - Arrival)

$P_1 = 18 - 0 = 18$

$P_2 = 27 - 4 = 23$

$P_3 = 51 - 11 = 40$

$P_4 = 49 - 10 = 39$

$P_5 = 32 - 8 = 24$

waiting (turnaro - burst t.)

$P_1 = 18 - 18 = 0$

$P_2 = 23 - 9 = 14$

$P_3 = 40 - 2 = 38$

$P_4 = 39 - 17 = 22$

$P_5 = 24 - 5 = 19$

av. turnaro

$18 + 23 + 40 + 39 + 24 = 144$

$144 / 5 = 28.8$

av. wait

$0 + 14 + 38 + 22 + 19 = 93$

$93 / 5 = 18.6$

fully add first & then divide 5

ID	Arr	burst	Comp	turn	wait	Actual
P_1	0	15	15	15	0	15
P_2	6	15	45	39	24	39
P_3	6	4	49	43	39	43
P_4	11	9	58	47	37	47
P_5	4	15	30	26	11	26

39
15
24

P_1	P_5	P_2	P_3	P_4

0 15 30 45 49 58

turn arr (Comple − Arrival) waiting (turn − burst)

$P_1 = 15 - 0 = 15$ $P_1 = 15 - 15 = 0$

$P_2 = 45 - 6 = 39$ $P_2 = 39 - 15 = 24$

$P_3 = 49 - 6 = 43$ $P_3 = 43 - 4 = 39$

$P_4 = 58 - 11 = 47$ $P_4 = 47 - 9 = 37$

$P_5 = 30 - 4 = 26$ $P_5 = 26 - 15 = 11$

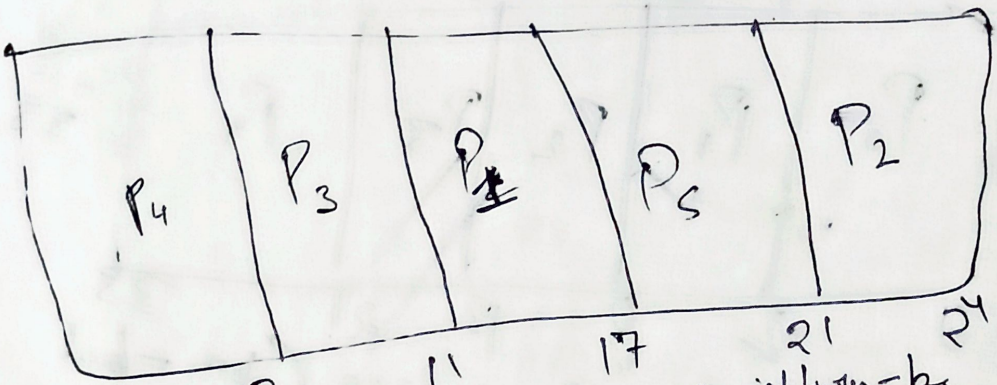
Av. turn $= \frac{15 + 39 + 43 + 47 + 26}{5} = 34$

Av. waiting $= \frac{0 + 24 + 39 + 37 + 11}{5} = 22.2$

1.8
5 | 59
5
40
40
2
5 | 30
30
2

Q.1 of 07

ID	Arv.	burst	Comp.	turn A.	waiti.
P_1	2	6	17	15	9
P_2	5	3	24	19	16
P_3	1	8	11	10	2
P_4	0	3	3	3	0
P_5	4	4	21	27	23
				54	30



turn Arr. (Comp. − Ai)

$P_1 = 17 - 2 = 15$

$P_2 = 24 - 5 = 19$

$P_3 = 11 - 1 = 10$

P_4 3 − 0 = 3

P_5 = 21 − 4 = 27

Av. turn = 1.8

Av. waiting = 6

waiti. (turn − b.

$P_1 = 15 - 6 = 9$

P_2 19 − 3 = 16

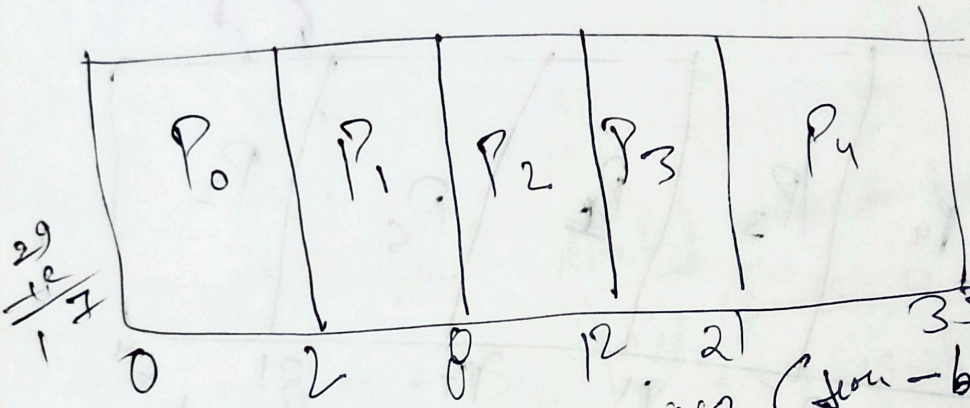
$P_3 = 10 - 8 = 2$

P_4 3 − 3 = 0

$P_5 = 27 - 4 = 23$

Question - 2

ID	Ar	Bt	Ct	Turn.	Wait
P_0	0	2	2	2	0
P_1	1	6	8	7	1
P_2	2	4	12	10	8
P_3	3	9	21	18	15
P_4	4	12	33	29	23
				66	



Turn Ar. (comp - Ar)

P_0 2 - 0 = 2
P_1 8 - 1 = 7
P_2 12 - 2 = 10
P_3 21 - 3 = 18
P_4 33 - 4 = 29

Waiting Time (Turn - Bt)

P_0 2 - 2 = 0
P_1 7 - 6 = 1
P_2 10 - 2 = 8
P_3 18 - 3 = 15
P_4 29 - 4 = 23

Av. Turn Ar. $66 = 13.2$

Av. waiting $= 7.8$

turn Ar. (Comp - Ar)

$P_0 = 2-0 = 2$

$P_1 = 8-1 = 7$

$P_2 = 12-2 = 10$

$P_3 = 21-3 = 18$

$P_4 = 33-4 = 29$

Av turn = 66 % 5

$$5\overline{)66}\,(13.2$$

$$\begin{array}{r} -5 \\ \hline 16 \\ -15 \\ \hline 10 \\ 10 \\ \hline 0 \end{array}$$

wait'g (tur - burst)

$P_0 = 2-2 = 0$

$P_1 = 7-6 = 1$

$P_2 = 10-4 = 6$

$P_3 = 18-9 = 9$

$P_4 = 29-12 = 17$

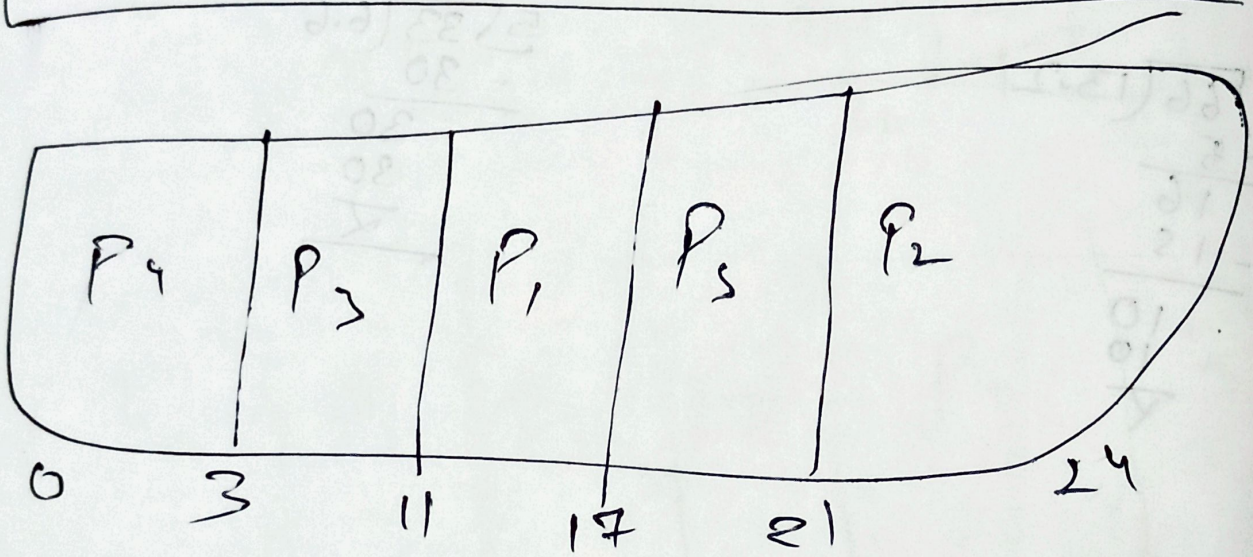
Av. wait'g = 33 % 5

$$5\overline{)33}\,6.6$$

$$\begin{array}{r} -30 \\ \hline 30 \\ 30 \\ \hline 0 \end{array}$$

Question - 1

PID	At	Bt	Ct	TAT
P_1	2	6	3	1
P_2	5	3	11	6
P_3	1	8	17	16
P_4	0	3	21	21
P_5	4	4	24	20



Turn around :- (Ct - At)

$P_1 = 3 - 2 = 1$

$P_2 = 11 - 5 = 6$

$P_3 = 17 - 1 = 16$

$P_4 = 21 - 0 = 21$

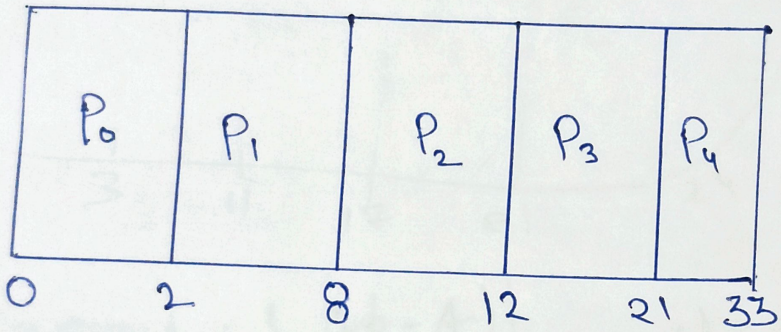
$P_5 = 24 - 4 = 20$

waiting (Turn - Burst)

$P_1 = 1 - 6$

Question -2

P. ID	A.T.	B.t.	C.T	T.A.T	W.T.
P_0	0	2	2	2	0
P_1	1	6	8	7	1
P_2	2	4	12	10	6
P_3	3	9	21	18	9
P_4	4	12	33	29	17



Turn Around [Complition - Arival Time]

$P_0 = 2 - 0 = 2$

$P_1 = 8 - 1 = 7$

$P_2 = 12 - 2 = 10$

$P_3 = 21 - 3 = 18$

$P_4 = 33 - 4 = 29$

WAITING Time [Turn Around – Busted Time]

$P_0 = 2 - 2 = 0$

$P_1 = 7 - 6 = 1$

$P_2 = 10 - 4 = 6$

$P_3 = 18 - 9 = 9$

$P_4 = 29 - 12 = 17$

Average Turn Around Time :-

$2 + 7 + 10 + 18 + 29 = 66$

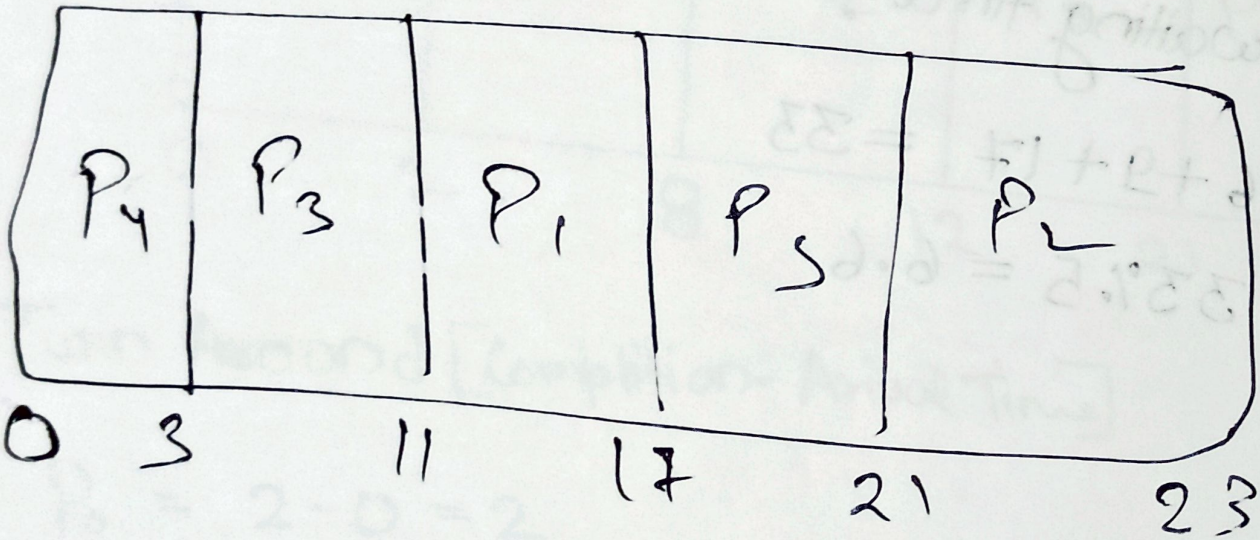
$66 \% 5 = 13.2$

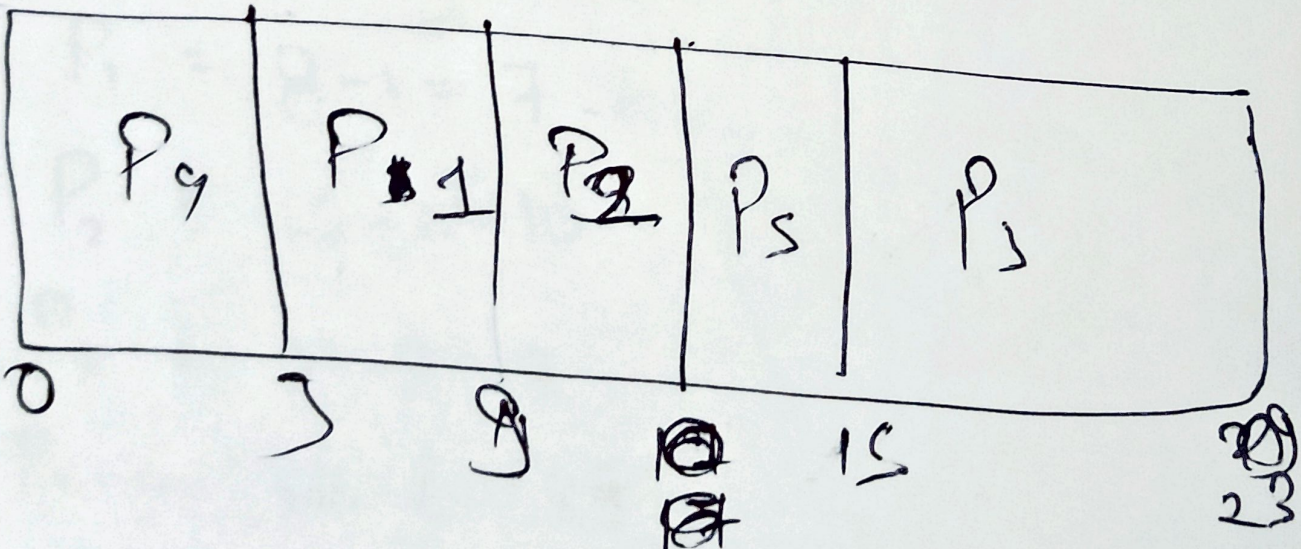
Average waiting time :-

$0 + 1 + 6 + 9 + 17 = 33$

$33 \% 5 = 6.6$

P.I	A.T	B.T	C.T	T.A.T	W.T
P_1	2	6	13	11	
P_2	5	2	9	4	
P_3	1	8	11	10	
P_4	0	3	3	3	
P_5	-4	4	15	19	





form A. (Con-A)

$P_1 = 3-2 = 1$

$P_2 = 9-5 = 4$

$P_3 = 11-1 = 10$

$P_4 = 15-0 = 15$

$P_5 = 23-4 = 19$

Wait (tw - bw)

$P_1 = 1-6$

P - 1 2 3 4 5

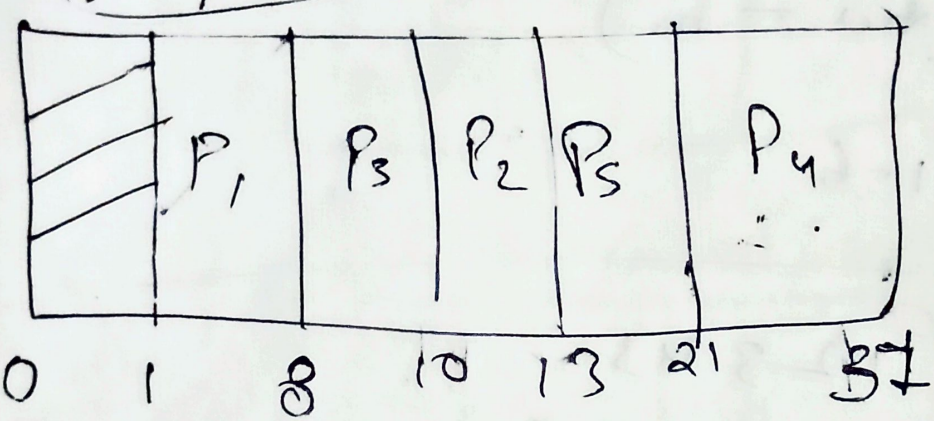
A - 1, 3, 6, 7, 9

B - 7, 3, 2, 10, 8

operating System

	A	B	C	TA	WT
P_1	1	7	8	7	0
P_2	3	9	13	10	7
P_3	6	2	10	4	2
P_4	7	10	31	24	14
P_5	9	8	21	12	4

~~P_1 P_2 P_3 P_4 P_5~~



Gen – A

$P_1 = 8 - 1 = 7$

$P_2 = 13 = 10$

$P_3 = 10 - 6 = 4$

$P_5 = 31 - 7 = 24$

$P_{25} = 21 - 9 = 12$

wait two - bx

$P_0 - 7-7 = 0$

$P_2 = 10 - 3 = 7$

$P_3 = 4 - 2 = 2$

$P_4 - 24 - 10 = 14$

$P_5 = 12 - 4$

Ans

tw = 11.4

wt = 5.4

2, 12, 6, 21, 33

	A	B	C	tw
P_0	0	2	2	
P_1	1	6	8	
P_2	2	4	12	
P_3	3	9	21	
P_4	4	12	33	

12
+21
33

~~P_0 P_1~~ P_2 P_3 P_4

P_0	P_1	P_2	P_3	P_4	

0 2 8 12 21 33