a.

	P1		2 P		P4		P5	
0		5	8	9			16	20
SJF								
Р3	P2	P5		P1			P4	
0 1		4	8		13			20
Non	-pree	mptive	prio	rity				
	P1		P5	P3	F	P4		P2
)		5		9 10			17	20
DD /		um = 2						

b & c.

Turnaround time → Completed time – Arrival time

(In this case, the arrival time for all five processes is 0)

Waiting time  $\rightarrow$  Turnaround time – Burst time

### **FCFS**

Process	Burst time	Priority	Turnaround time	Waiting time
P1	5	4	5	0
P2	3	1	8	5
Р3	1	2	9	8
P4	7	2	16	9
P5	4	3	20	16

#### <u>SJF</u>

Process	Burst time	Priority	Turnaround time	Waiting time
P1	5	4	13	8
P2	3	1	4	1
Р3	1	2	1	0
P4	7	2	20	13

- 1					
				_	_
	DЦ	//		l Q	//
	1 3	7	5	0	<del> </del>

# **Non-preemptive priority**

Process	Burst time	Priority	Turnaround time	Waiting time
P1	5	4	5	0
P2	3	1	20	17
Р3	1	2	10	9
P4	7	2	17	10
P5	4	3	9	5

# RR (quantum = 2)

Process	Burst time	Priority	Turnaround time	Waiting time
P1	5	4	17	12
P2	3	1	12	9
P3	1	2	5	4
P4	7	2	20	13
P5	4	3	16	12

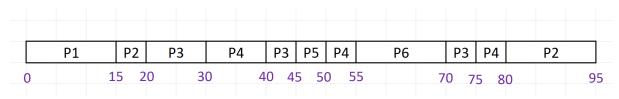
d.

Scheduling	Average turnabout time	Average waiting time
FCFS	$\frac{5+8+9+16+20}{5} = 11.6$	$\frac{0+5+8+9+16}{5} = 7.6$
SJF	$\frac{13+4+1+20+8}{5} = 9.2$	$\frac{8+1+0+13+4}{5} = 5.2$
Non-preemptive priority	$\frac{5+20+10+17+9}{5} = 12.2$	$\frac{0+17+9+10+5}{5} = 8.2$
RR (quantum = 2)	$\frac{17 + 12 + 5 + 20 + 16}{5} = 14$	$\frac{(12+9+4+13+12)}{5} = 10$

Out of all the scheduling algorithms, SJF (Shortest Job First) scheduling results in the minimum waiting time across all processes.

Ex 5.18

a.



Explanation:

P1:  $0 \rightarrow 15$  (highest priority)

P2: 15 → 20 (highest priority)

P3: 20 → 30

P4: 30 → 40

At t = 20, P3 arrives with higher priority and P2 gets preempted. At t = 25, P4 arrives with the same priority as P3, so RR scheduling is applied with quantum = 10

P3: 40 → 45

At t = 45, P5 arrives with a higher priority and P3 gets preempted. The instructions say that when preempted in the RR scheduling, it gets moved to the back of the queue.

P5: 45 → 50

P4 is in front of the queue since P3 was previously preempted

P4: 50 → 55

At t = 55, P6 arrives with higher priority and P4 gets preempted

P6: 55 → 70

P4 was preempted, which means P3 is in front of the queue

P3: 70 → 75

P4: 75 → 80

P2: 80 → 95

#### b & c.

Process	Priority	Burst	Arrival	Turnaround time	Waiting time
P1	8	15	0	15	0
P2	3	20	0	95	75
P3	4	20	20	55	35
P4	4	20	25	55	35
P5	5	5	45	5	0
P6	5	15	55	15	0