
SRTF

LRTF

# FCFS with IOBT & Scheduling overhead

G

| P.No | A.T | Lifecycle (B.T ; IOBT ; B.T) | S = 1 TAT | WT |
|---|---|---|---|---|
| 1 | 0 | 3 ; 5 ; 2 | 12 | 0 |
| 2 | 2 | 4 ; 7 ; 3 | 18 | 2 |

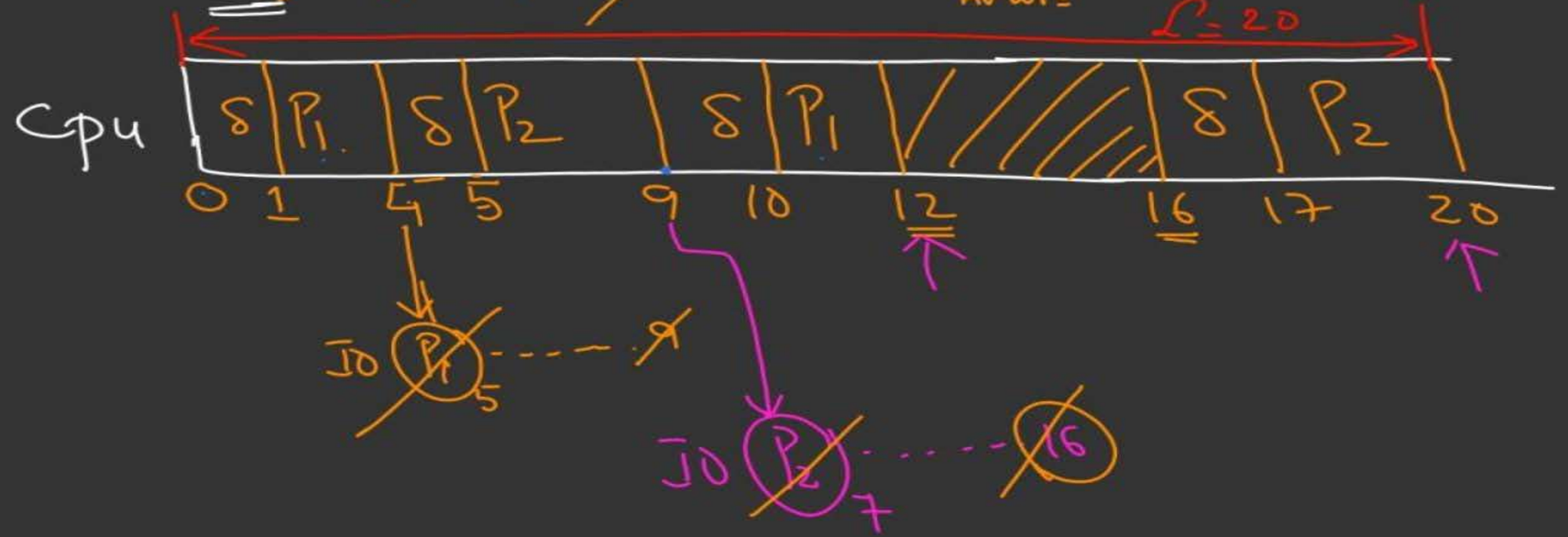
[Assuming each Process has its own IO-Dev.]

Concurrent IO

Av. TAT =

Av. WT =

R.Q: ~~P1 ; P2 ; P1 ; P2~~




$WT = TAT - (BT + IOBT + \delta)$

$P_1 = 12 - (10 + 2)$

$= 0$

$P_2 = 18 - (14 + 2)$

$= 2$

S=0

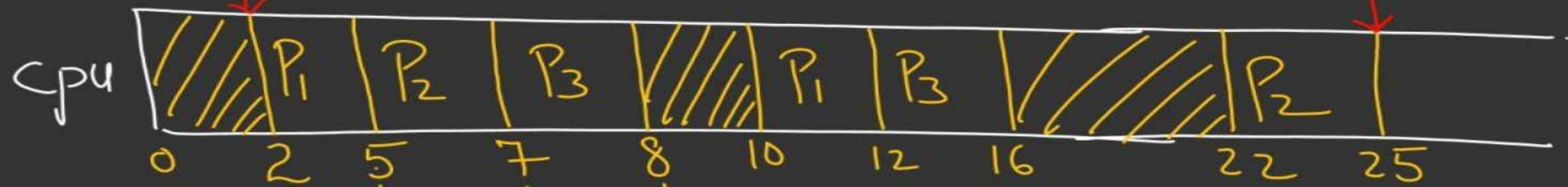
| P.NO | A.T | <BT ; IOBT ; BT> |
|---|---|---|
| 1 | 2 | <3 ; 5 ; 2> x |
| 2 | 3 | <2 ; 15 ; 3> |
| 3 | 5 | <1 ; 2 ; 4> x |

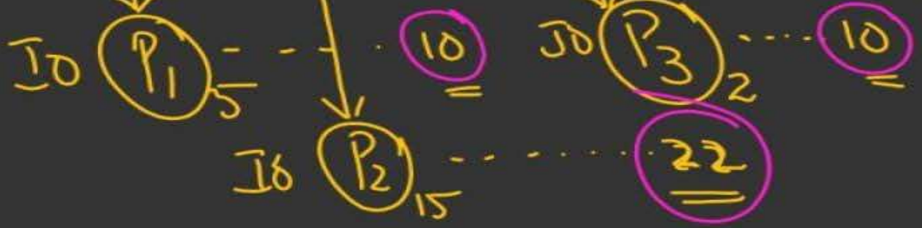
L = 23

A.TAT=
A.WT=
%cpu-Idleness

TAT = CT − AT
WT = TAT − (BT + IOBT)

RQ: ~~P1 ; P2 ; P3 ; P1 ; P3 ; P2 ;~~



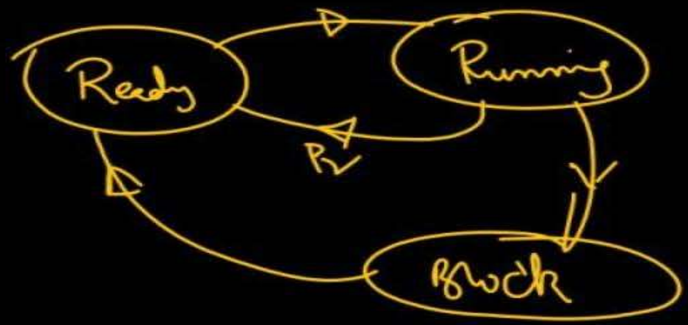



**Q.1** Consider the following statements about process state transitions for a system using preemptive scheduling

I. A running process can move to ready state ✓
II. A ready process can move to running state ✓
III. A blocked process can move to running state ✗
IV. A blocked process can move to ready state.

Which of the above statements are TRUE?

(A) I, II and IV only ✓
(B) I, II, III and IV
(C) I, II and III only
(D) II and III only



Q.2 Consider three Processes $P_1, P_2, P_3$ arriving in the Ready Queue at time 0 in the order $P_1, P_2, P_3$. Their service time requirements are 10,20&30 units respectively. Each Process spends 20% of its Service time on I/O followed by 70% of its Service time on Computation at CPU and last 10% on I/O before completion.
Assuming Concurrent I/O and negligible Scheduling Overhead. Calculate for FCFS Scheduling
(i) Average TAT of Processes
(ii) % CPU idleness

Home Work

Solve the Question assuming $\delta = 1$

$P_1 \rightarrow 10$; $P_2 \rightarrow 20$; $P_3 \rightarrow 30$

20% 70% 10%

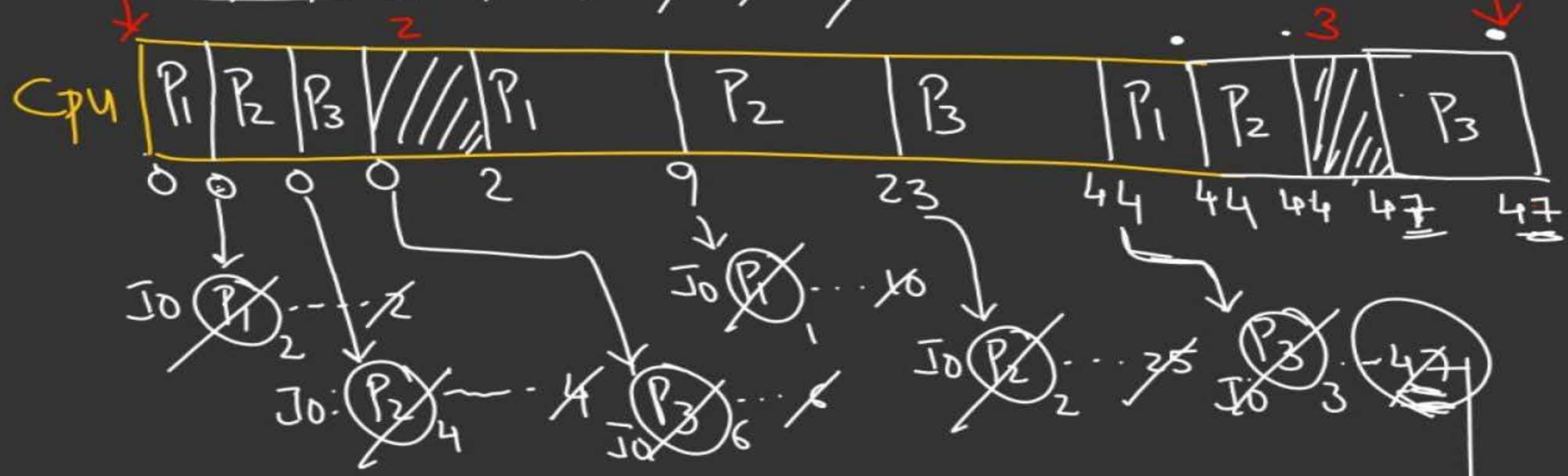
| P.No | A.T | IOBT | BT | IOBT |
|---|---|---|---|---|
| 1 | 0 | 2 | 7 | 1 |
| 2 | 0 | 4 | 14 | 2 |
| 3 | 0 | 6 | 21 | 3 |

$L = 47 - 0 = 47$

$\therefore$ CPU Idleness $= \frac{5}{L} = \frac{5}{47} = 10.63$

Avg TAT $= \frac{44+44+47}{3} =$

R.Q: ~~$P_1, P_2, P_3, P_1, P_2, P_3, P_1, P_2, P_3$~~




Can Process goto IO directly from Ready & "No" Running State

Terminate

Block (IO) → Running

## Non-Concurrent-IO

System has only one IO-device for all Processes;

S = 1

| P.No | A.T | < BT ; JOBT ; BT > |
|---|---|---|
| 1 | 0 | < 3 ; 8 ; 3 > |
| 2 | 2 | < 4 ; 7 ; 2 > |

R.Q : ~~P1 ; P2 ; P1 ; P2 ;~~