

Operating System:

Practice Questions: Scheduling

By: Vishvadeep Gothi



VISHVADEEP GOTHI SIR

AIR 19

in GATE 2010



**ME from IISc Bangalore
MTech BITS Pilani (Data Sc.)**



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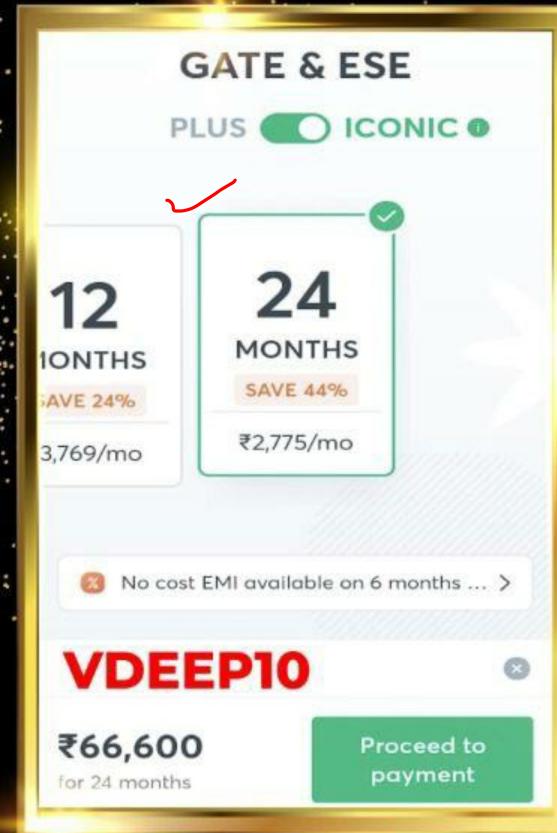
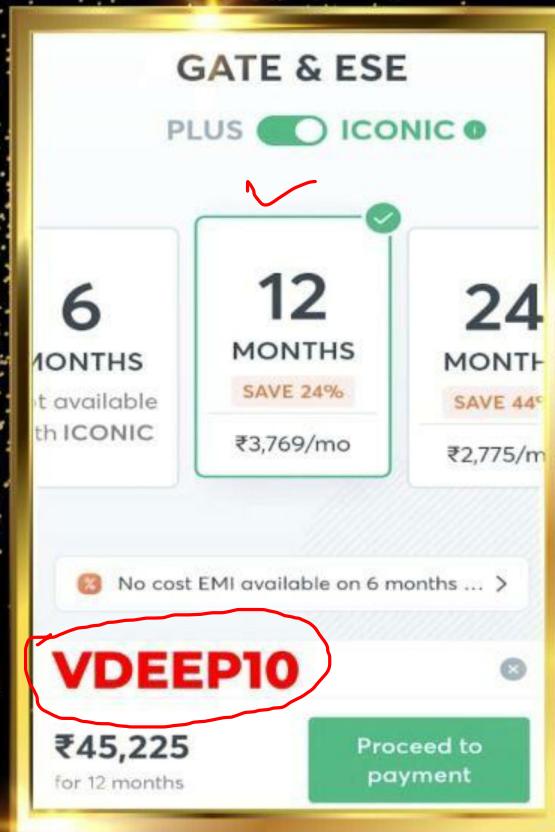
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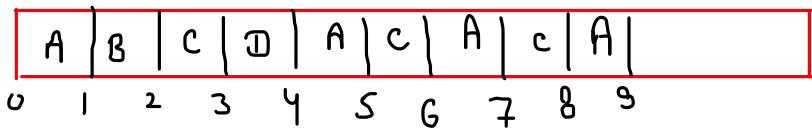
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Question

(ESE)

Ans = 9

Four processes to be executed on a single processor system arrives at time 0+ in the order A, B, C and D. Their CPU burst time requirements are 4, 1, 8, 1 time units respectively. The completion time of A under Round-Robin scheduling with time slice of one time unit is?



	AT	BT
A	0	X B Z X
B	0	X
C	0	g t g s
D	0	X

Question

ESE for ECE

Consider the following set of processes. Calculate average waiting time of processes for following algorithms:

FCFS, Non-preemptive SJF, and Round-robin (quantum = 10ms)

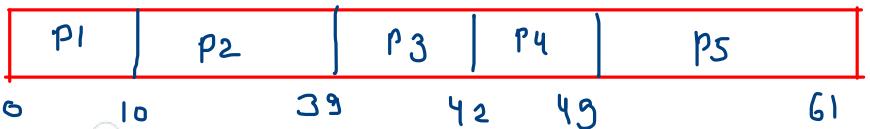
Process	Arrival Time	Burst Time
P1	0	10ms
P2	0	29ms
P3	0	3ms
P4	0	7ms
P5	0	12ms

	WT
FCFS	28 msec
SJF	13 msec
RR	23 msec

Solution: FCFS

$$\text{avg } WT = \frac{140}{5} = 28$$

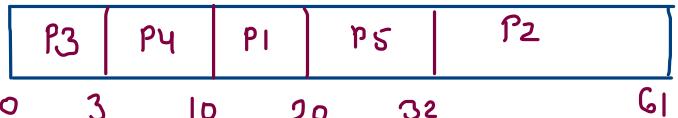
Process	Arrival Time	Burst Time	Completion Time	Turnaround Time	Waiting Time
P1	0	10ms	10	10	0
P2	0	29ms	39	39	10
P3	0	3ms	42	42	39
P4	0	7ms	49	49	42
P5	0	12ms	61	61	49



Solution: SJF

Process	Arrival Time	Burst Time	Completion Time	Turnaround Time	Waiting Time
P1	0	10ms	20	20	10
P2	0	29ms	61	61	32
P3	0	3ms	3	3	0
P4	0	7ms	10	10	3
P5	0	12ms	32	32	20

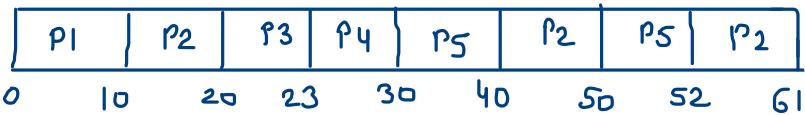
avg WT = $\frac{65}{5}$
 $= 13 \text{ msec}$



Solution: RR (Q=10)

Process	Arrival Time	Burst Time	Completion Time	Turnaround Time	Waiting Time
P1	0	10ms	10	10	0
P2	0	29ms	61	61	32
P3	0	3ms	23	23	20
P4	0	7ms	30	30	23
P5	0	12ms	52	52	40

$$\text{avg } wT = \frac{115}{5} = 23$$



Question GATE-2006

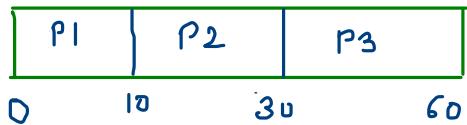
Consider three CPU intensive processes, which require 10, 20 and 30 time units and arrive at times 0, 2 and 6 respectively. How many context switches are needed if the operating system implements a shortest remaining time first scheduling algorithm?

Do not count the context switches at time zero and at the end

- (A) 1
- (C) 3
- (B) 2
- (D) 4

Method 1:-

Draw gantt chart



no. of context switches = 2

Method 2:-

Preemption happens only when a new arriving process has shorter BT than current running process.

Here both new arriving processes are having larger BT, hence execution will be done without preemption.

Question

I/O

If the waiting time for a process is p and there are n processes in the memory, then the CPU utilization is?

if no I/O operation
for processes

$$\text{CPU utilization} = 100\% \\ = 1$$

fraction of time



$$\text{Total } v \text{ waiting time} = p^n$$

fraction of

$$\text{CPU utilization} = 1 - p^n$$

Next Class

✓ Multilevel Queue Scheduling

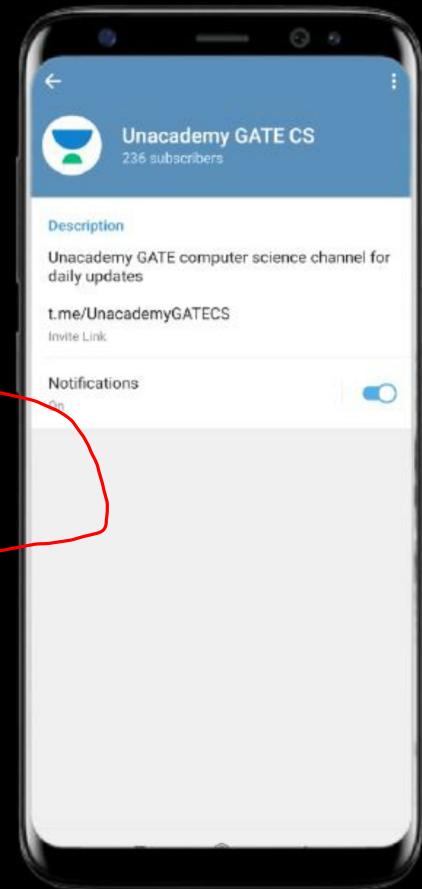


✓ Multilevel Feedback Queue
Scheduling





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