Branch : CSE & IT Batch : Hinglish

Operating System

CPU Scheduling

DPP 05

[NAT]

1. Consider the following table

Process	P1	P2	P3	P4
Arrival Time	0	1	2	3
Service Time	6	3	1	4

Find the average turn around time when processes are scheduled with SRTF. (Upto 2 decimal point)

[MCQ]

2. Consider the following statements:

(i) If all jobs arrive at the same point in time, a SJF and an SRTF scheduler will behave the same.

(ii) If all jobs arrive at the same point in time and have identical run lengths, a FIFO and a SJF scheduler will behave the same.

Which of the following statements is true?

(a) Only (i) is true.
(b) Only (ii) is true.
(c) Both (i) and (ii) are true.
(d) Both (i) and (ii) are false.

[MCQ]

3. Consider the following process table with Arrival and Burst time

Process	Arrival Time	Burst Time
P_1	1	2
P_2	6	4
P_3	4	10
P_4	5	6

Average waiting time of these processes by using round robin scheduling, where time quantum is 2 unit.

(a) 2.25 (b) 6.25
(c) 4.25 (d) 8.25

[MCQ]

4. Which of the following scheduling algorithm is better than others in forms of response time.

(a) SJF (Shortest job first)
(b) SRTF (Shortest remaining time first)
(c) FCFS (First come first serve)
(d) RR (Round Robin)

[MCQ]

5. Consider the 3 processes, P1, P2 and P3 shown in the table:

Process	Arrival Time	Burst Time
P1	0	5
P2	4	7
P3	6	4

The completion order of the 3 processes under the policies FCFS and RR2 (round robin scheduling with CPU quantum of 2-time units) are

(a) FCFS: P1, P2, P3; RR2: P1, P2, P3
(b) FCFS: P1, P3, P2; RR2: P1, P3, P2
(c) FCFS: P1, P2, P3; RR2: P1, P3, P2
(d) FCFS: P1, P3, P2; RR2: P1, P2, P3

[MSQ]

6. Suppose a system has 5 processes A, B, C, D, E all processes are arrived at time 0 and have burst time 4, 5, 7, 2, 5 respectively. If the time slice for each process is 2 unit and each context switch requires one unit of time (excluding first and last context switch), then which of the following statement is correct?

(a) At time 25, Process B is running on the system.
(b) Process E finishes execution at time 31.
(c) Total CPU overhead activity is 34.2%.
(d) Process B finishes its execution before process E

[MCQ]

7. In the Round Robin scheduling policy if the time quantum used is more than the maximum time required to execute any process. Then the policy will ____.

(a) Behave same as FCFS.
(b) Behave same as SJF.
(c) Behave same as HRRN.
(d) None of these.

[MCQ]

8. Which if the following scheduling algorithm treat every process equally?

(a) Shortest Job First
(b) Shortest remaining Time first (SRTF)
(c) Longest remaining Time first (LRTF)
(d) Round Robin

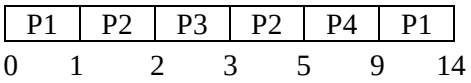
Answer Key

1. **(6.25)**
2. **(c)**
3. **(b)**
4. **(d)**
5. **(c)**
6. **(c, d)**
7. **(a)**
8. **(d)**

Hint & Solutions

1. (6.25)

Gantt Chart:



Average Turn Around time:

TAT = Completion Time – Arrival Time

TAT(P1) = 14 – 0 = 14

TAT(P2) = 5 – 1 = 4

TAT(P3) = 3 – 2 = 1

TAT(P4) = 9 – 3 = 6

Average Turn Around time: (14 + 4 + 1 + 6)/4 = 6.25

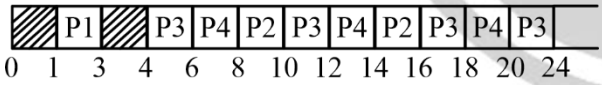
2. (c)

Since all jobs arrive at the same point in time, a SJF and an SRTF scheduler run all process for same amount of time.

All are of identical run lengths FIFO and a SJF scheduler will behave the same, Since no shortest job concept will be there.

3. (b)

Gantt Chart



Process	Arrival Time	Burst Time	Completion Time	Turnaround Time	Waiting Time
P_1	1	2	3	2	0
P_2	6	4	16	10	6
P_3	4	10	24	20	10
P_4	5	6	20	15	9

Average waiting time = $\frac{0+6+10+9}{4}$

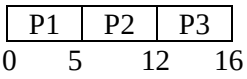
$= \frac{25}{4} = 6.25$

4. (d)

Round Robin scheduling algorithm is best in terms of response time. Due to fixed time quantum each process has equal chance of visiting CPU.

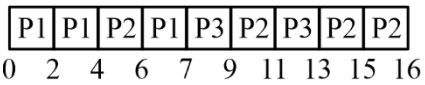
5. (c)

FCFS:



Completion order: P1, P2, P3

Round Robin:



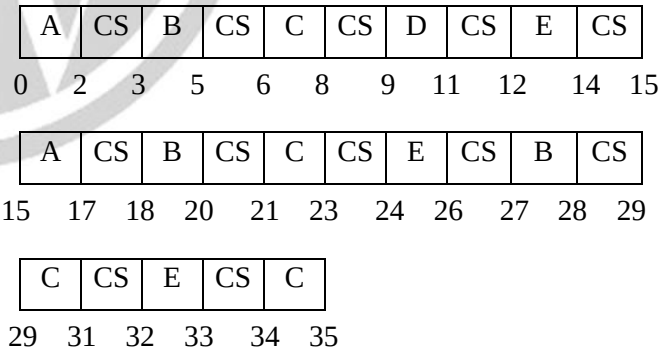
Completion order for RR: P1, P3, P2

Therefore, option C is correct answer.

6. (c, d)

Time quantum = 2

Process	Arrival Time	Burst Time
A	0	4
B	0	5
C	0	7
D	0	2
E	0	5



(a) At time 25, Process B is running on the system. Incorrect. At time 25 process E is running on CPU.

(b) Process E finishes execution at time 31. Incorrect. Process E finishes its execution at time 33.

(c) Total CPU overhead activity is 33%. Correct. CPU overhead activity is = 12/ 35 = 34.2%

(d) Process B finishes its execution before process E. Correct. Process B finishes its execution at time 28 whereas process E finishes its execution at time 33.

7. (a)

If the time quantum used in the Round Robin scheduling algorithm is more than the maximum burst time then it will degenerate to a first come first serve (FCFS) algorithm. So, option a is correct.

8. (d)

In round robin process scheduling, all process are given an equal amount of time for execution despite of their longer/ shorter/ remaining burst time. In round robin scheduling policy, every process is treated equally and given equal time to execute on CPU. In SJF and SRTF process with shorter burst time has priority over process with longer burst time, and in LRTF process with longer burst time has priority over process with shorter burst time.

Therefore, option d is the correct answer.