CS & IT ENGINEERING

Operating System

Process Synchronization/ Coordination

DPP 01 Discussion Notes

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01 Question

02 Discussion

Q.1 [MCQ]

Consider the following statements:

S_1: If all jobs have identical run lengths, a RR scheduler provides better average turnaround time than FIFO. False

S_2: With a MLFQ scheduler, high priority jobs have longer time-slices than low priority jobs. False

Which of the following is true?

A. Only S_1

B. Only S_2

C. Both S_1 and S_2

D. None of these

Q.2

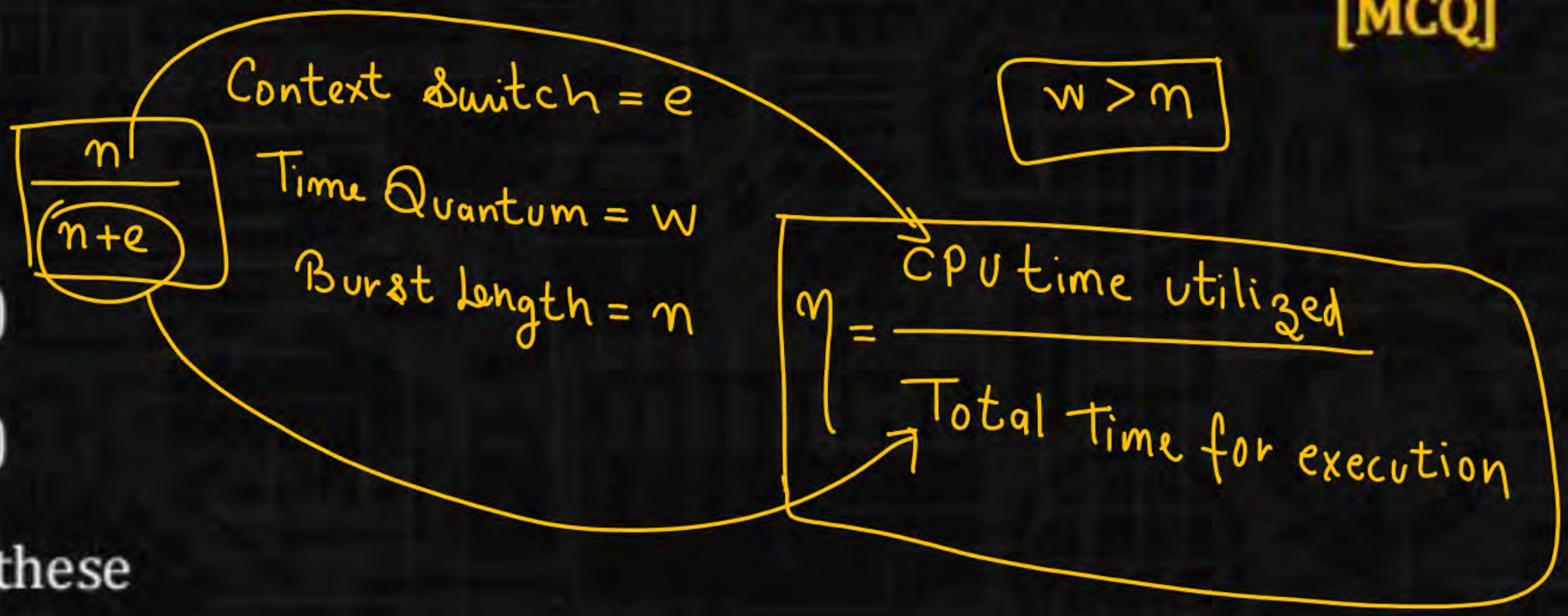
Suppose there is a system operating upon round-robin scheduling, If e denotes time that is been needed to do a process switch and if w denotes round-robin time quantum and if n denotes average time that a process is required to run. Then what will be the CPU efficiency under following circumstances. If round-robin time quantum is greater than the average time i.e. (w > n). [MCQ]

A. n

B. 1/(n + e)

C. n/(n + e)

D. None of these



Q.3

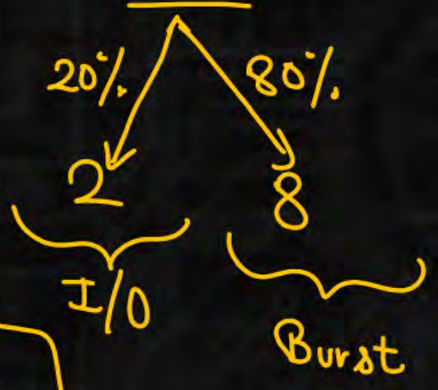
A process spends 20% of its execution time waiting for completion of I/O operation. If there are 8 processes in memory at once, then the probability of CPU time utilized is _____ %. (Assume all I/O operations are overlapped). (Upto 2 decimal places) **[NAT]**

8 Processes

Exc. time = 10 units

$n = 8$

p(process performs I/O) $= 0.2$



$1-(0.2)^8 \Rightarrow 1 - 0.00000256$

$0.99999744 * 100 \Rightarrow 99.99744\%$

99.99 %

Q.4

Considering the exponential average behavior used to predict the next CPU burst. If α = 0.70 and τ_0 = 30 ms and previous (T_0, T_1, T_2, T_3) runs were as 10, 12, 15, 20. The predicted value of τ_4 18.33 (up to two decimal places). **[NAT]**

α = Smoothening factor = 0.70

τ_0 = 30 ms

$T_0 = 10$, $T_1 = 12$, $T_2 = 15$, $T_3 = 20$

$$\tau_{n+1} = t_0(\alpha) + \tau_n(1-\alpha)$$

$\tau_1 = 0.7(10) + 0.3(30)$

$\tau_1 = 7 + 9 = 16$ ms

$\tau_2 = 0.7(12) + 0.3(16)$

$= 8.4 + 4.8 \Rightarrow 13.2$ ms

$\tau_3 \Rightarrow 0.7(15) + 0.3(13.2)$

$\Rightarrow 10.5 + 3.96 \Rightarrow 14.46$ msec

$\tau_4 \Rightarrow 0.7(20) + 0.3(14.46)$

$\Rightarrow 14 + 4.338$

$\Rightarrow 18.338$

Q.5

What are the limitations of Single- Ready queue?

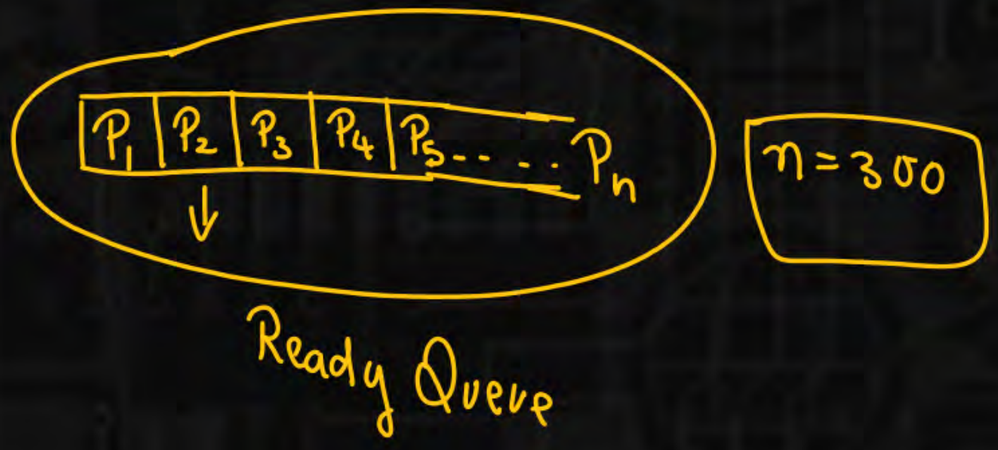
[MSQ]

A. All processes have to use same scheduling technique. True

B. Lots of searching time required to select single process. True

C. Multiple processes cannot run simultaneously. False

D. In a single-ready queue only single process can reside. False



Q.6

Which of the following is/are correct regarding MLQ(Multi-level queue) scheduling?

[MSQ]

A. Some processes may suffer from starvation. True

B. Processes are divided into categories and scheduled on different ready queue. True

C. Multiple scheduling algorithms can be implemented simultaneously. True

D. It has minimal scheduling overhead. True


Highest Priority
System Process
Interactive Process
Background Process
Lowest Priority
Round Robin CPU Scheduling
SJF
P40 FCFS

Q.7

Which process can be affected by other processes executing in the system?

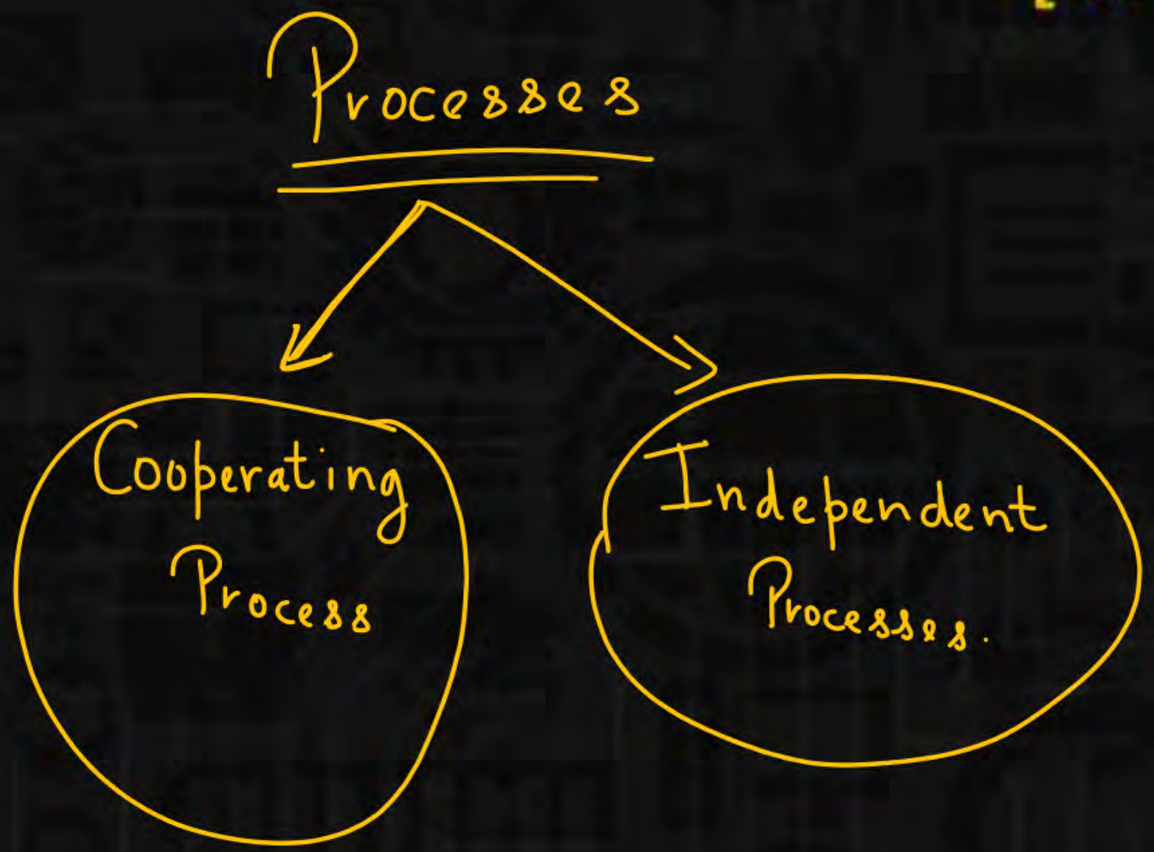
[MCQ]

A. cooperating process

B. child process

C. parent process

D. independent process



Q.8

A race condition___.

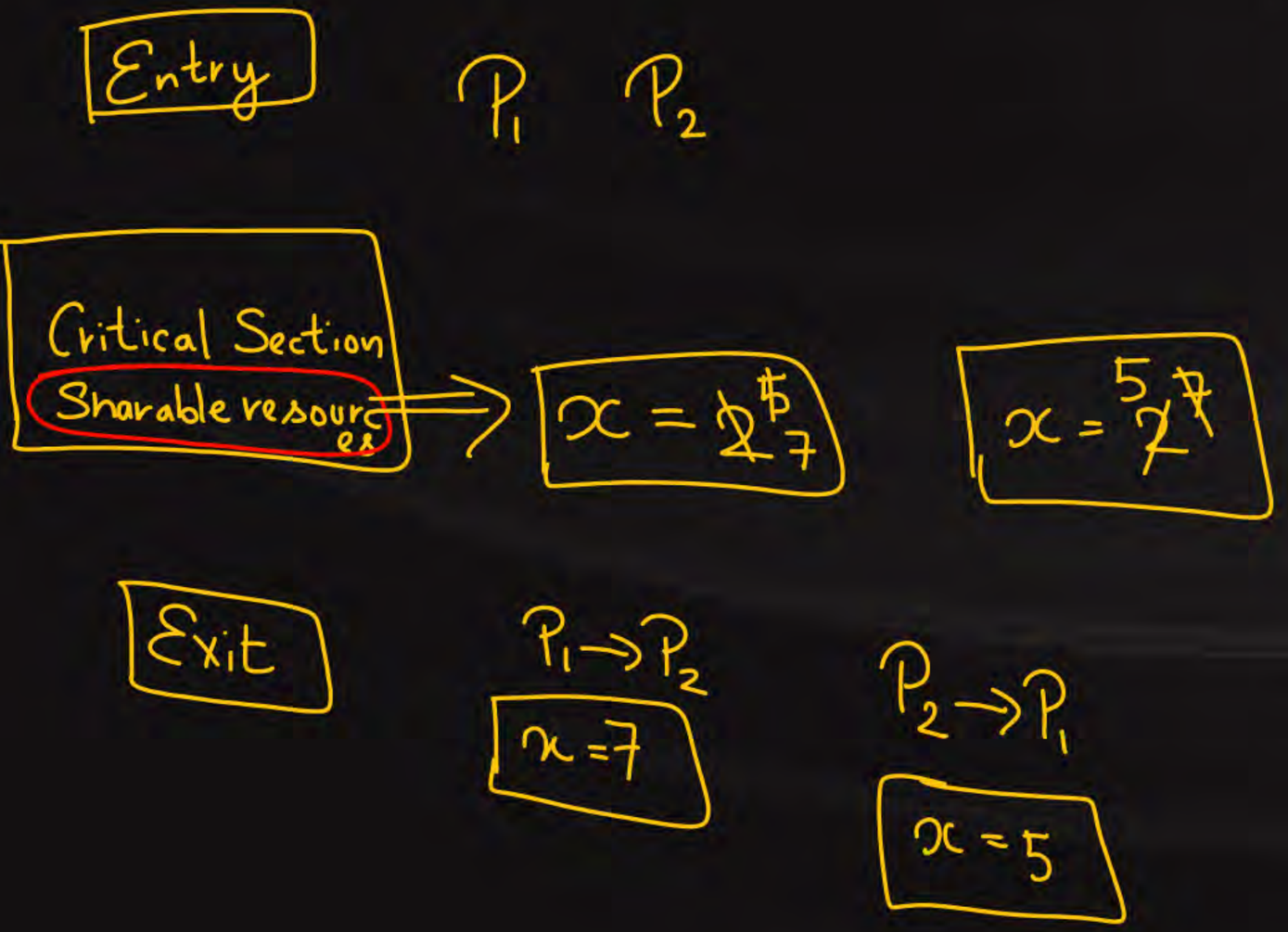
[MSQ]

A. Occurs when two threads enter critical section at the same time.

B. Occurs when one thread is in critical section and another thread cannot access critical section.

C. Occurs when two threads access a shared variable at the same time.

D. None of these


Entry
P1
P2
Critical Section
Sharable resources
x = 7
x = 5
Exit
P1 → P2
x = 7
P2 → P1
x = 5


THANK YOU GW
SOLDIERS !