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OS ACTIVITY #03

Q1. Describe single threaded & multi threaded process.

Single threaded process: It contains the execution of instruction in a single sequence. It refers to executing an entire process from beginning to end without interruption by a thread. Each process supports only single Thread.

Multi threaded process: These processes contain the execution of instructions (multiple parts) at same time. Multiple threads within a process execute independantly but share resources. Multiple process executes in a process.

Q2. Describe the criteria for avoiding Race condition wrt critical region.

conditions to avoid race condition

① No two process can enter critical section simultaneously.
② No process outside cs may block other Process.
③ No process have to wait indefinitely to enter cs.

Criteria:

① Mutual exclusion:- only one thread at a time will be inside critical region.

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(2) progress: The process that are not executing in remainder section can participate in deciding which will enter CS. selection can not be postponed indefinitely.

(3) Bounded waiting: A bound must exist on number of times that the process may enter in critical section.

Q3 Differentiate between Concurrency & Parallelism

Concurrency	Parallelism
(1) Two or more calculations happen within the same time frame. have dependency.	(1) Two or more calculations happen simultaneously.
(2) Highly efficient because few workers are needed to accomplish multiple task.	(2) Not as efficient because many workers are used to accomplish one task.
(3) Accomplishes multiple task faster.	(3) Accomplishes a single task faster.

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Q4. Explain the types of memory barrier used for process synchronization.

Memory barrier/fence is a type of barrier instruction that causes cpu to force any changes in memory to be propogated to all other process

Types of memory barriers.

1) strongly ordered:- where any modification or changes in memory is immediately visible to other processors.

2) Weakly ordered:- where modifications to memory on one processor may not be immediately visible to another processors.

Q5. Describe peterson solution to avoid race condition.

Peterson solution is restricted to two process that alternate execution between their critical section and remainder section. we have two shared variables boolean flag and turn. only one out of 2 process enters cs and other remains in wait. satisfying mutual exclusion. progress is also assured, process outside cs does not blocle other processes. Bounded waiting is preserved as every process gets a fair change.