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BATCH -15

PAGE NO.	icnn
DATE:	/ /

## Assignment - 1

Ques-1. Write a short note on monitors with respect to Synchronisation. How is it different from semaphores?

Ans:-

It is a Synchronization technique that enables threads to mutual exclusion and the wait() for a given condition to become true.

It is an abstract data type. It has a shared variable and a collection of producers executing on the shared variables.

A process may not directly access the shared data variables, and procedures are required to allow several processes to access the shared data variables.

The monitor is one of the ways to achieve process Synchronization. The monitor is supported by programming languages to achieve mutual exclusion between processes.

① It is the collection of condition variables and procedures combined together in a special kind of module or a package.

② The processes running outside monitor can't access internal variable of monitor's but can call procedures of monitors.



③ Only one process at a time can execute code inside monitors.

Mutual exclusion in monitors is automatic while in Semaphores, mutual exclusion needs to be implemented explicitly. Monitors can overcome timing errors that occur while using semaphores.

④ Shared variables are global to all processes in the monitor while shared variables are hidden in semaphores.

Semaphore  $\rightarrow$  Using a counter to flag to control access some shared resources in a concurrent system, implies use of semaphores.

① A counter to allow only 50 passengers to acquire the 50 seats of any Thread / Bus / train. And to allow a new passenger only if someone vacates a seat.

② A binary space indicating free / occupied space.

③ Flag only reveal state of Resource, no count or any other information on the waiting or running objects on the resources.

Monitor  $\rightarrow$  A Monitor synchronizes access to an object by communicating with threads interested in the object, asking them to acquire access or wait for some condition.