(1) What is “user mode” of a processor?

The “user mode” of a processor is a mode of a processor in which a processor cannot execute some instructions that directly access hardware resources.

(2) What is “race condition”?

Race condition is a situation in which the final results on a shared resource depends on unpredictable context-switching for the processes that share the resource.

(3) What is “critical section”?

“Critical Section is a section in a program where at most one process can exist at any given time”

OR

“Critical Section is a section in a program in which the machine codes cause race condition”
(4) What does “atomic” in “atomic operations” mean?

The term, “atomic” in atomic operations” mean that once an operation (or an activity) starts execution, its execution will never be interrupted (or “never be preempted”) until that operation is completed.

(5) What “signal” system call to a semaphore exactly performs?

Signal

- If no one waiting on S, set S = 1
- If some one waiting on S, let the first proceed to CS and leave S = 0