

Question 1. Write 4 characteristics of deadlock and explain each of them

There are four conditions that must be present simultaneously for a deadlock to occur:

#### 1. Mutual Exclusion

The mutual exclusion condition must hold for non-shareable resources that is only one process can use a resource at a time. If another process want to access that resource, then it must wait until the resource has been released.

#### 2. No Preemption

There be no preemption of resources that have already been allocated that means no process is allowed to preempt another process forcibly in order to gain a release of a resource from it. So, we should check before resource allocation if it has already allocated to another process.

#### 3. Hold and Wait

When a process is already holds a resource and while for additional resource that are currently being held by other processes. This situation is known as hold and wait.

#### 4. Circular Wait

Processes waiting for resources from the others form a circular chain, that means all waiting processes form a circular chain or circular list where each process in the list is waiting for a resource held by next process in the list.