

1. When a process creates a new process using the fork() operation, Shared memory segments is shared between the parent process and the child Process.

Because, Shared memory segments exist between parent process and child Process. If any data needs to be shared then, we store the data in shared memory so that both processes can use it. Again, in Shared memory segments the same memory is accessible to both the parent and the child.

2.

A process is terminated when it executes its last statement or termination caused by another process. When a process is terminated, the resources are deallocated. So, whenever a parent process is terminated, init process adopts the child processes. By doing this, it avoids orphaned processes turning into zombie processes.

3. Context switching is a method used by the OS to switch a process from one state to another to execute its function. So, when a process is being switched out, the OS needs to save the present state of the process so that we can use it later. PCB smooth context switching and ensures processes can resume from where they left off. Moreover, With the help of a PCB, we can multitask effectively and prevent any data or memory corruption from one process to another.

4.

1) When the program is first started but hasn't begun execution the state of the process is new. Because a new process is a program that the OS will identify and load into the main memory. Execution is not started in this state. 2) While the program is downloading the file but waiting for the network to respond, the state of the process is waiting state. Because When a process waits for a certain resource to be assigned or for the input from the user then the OS moves this process to the waiting state. 3) When the file is fully downloaded, and the program begins processing it, the state is running state. Because, the process is actively using the CPU to perform the task. 4) After the program finishes processing the file, the state is terminated state. Because, When a process finishes its execution, it comes in the termination state. All the context will be terminated by the OS.

5.

A process that completed its execution but still has an entry in the process table is known as a zombie process and an orphan is a child process that keeps executing even though its parent process is terminated or completed without waiting for the child process execution. Again, an orphan process continues using system resources since it is still running, zombie processes do not use as much system resources because they are not in the running phase. A zombie process is handled by the parent process and the init process handles the orphan process as its parent is terminated.

6. Convoy effect is the potential disadvantage of the FCFS scheduling algorithm. Because of the convoy effect, long running processes use cpu for a long time. On the other hand, the execution of shorter tasks is delayed . They need to wait for a long time to use the cpu, also the system may become less efficient.

7. For managing these tasks, priority scheduling might be a more effective approach. Between many tasks the process that has the highest priority is executed first in this case. We can do critical tasks faster by the help of priority scheduling . It reduces the average waiting time for processes .