1.

- The OS is a program that manages the computer’s resources, provides services for programmers, and schedules the execution of other programs on a processor.

2.

- Program creation: The OS provides a variety of facilities and services, such as editors and debuggers, to assist the programmer in creating programs.

- Program execution: A number of steps need to be performed to execute a program. Instructions and data must be loaded into main memory, I/O devices and files must be initialized, and other resources must be prepared. The OS handles all of this for the user.

- Access to I/O devices: Each I/O device requires its own specific set of instructions or control signals for operation. The OS takes care of these details.

- Controlled access to files: OS worries about the details involved such as understanding the nature of the I/O device and also the file format on the storage medium. Further, in the case of a system with multiple simultaneous users, the OS can provide protection mechanisms to control access to the files.

- System access: It provides protections of resources and data from unauthorized users and also resolves conflicts for resource contention.

- Error detection and response: The OS must make the response that clears error conditions with the least impact on running applications.

- Accounting: A good OS collects usage statistics for various resources and monitor performance parameters such as response time. On any system, this information is useful in anticipating the need for future enhancements and in tuning the system to improve performance.

3.

- Long-term scheduling: Determines which programs are admitted to the system for processes. It controls the degree of multiprogramming (number of processes in memory).

- Medium-term scheduling: This is part of the swapping section. Typically, the swapping decision is based on the need to manage the degree of multiprogramming. Determines whether to add to the number of processes that are partially or fully in main memory.

- Short-term scheduling: Also known as the dispatcher. Executes frequently and makes the fine-grained decision of which job to execute next.

- I/O scheduling: The decision as to which process's pending I/O request shall be handled by an available I/O device.

4.

- Program: executable file stored in external memory.

- Process: program in execution.

5.

- The purpose of swapping is to provide for efficient use of main memory for processes execution. It allows temporarily removing processes not in a ready state to replace with processes in a ready state.

6.

- The addressing mechanism must keep track of the physical addresses of the process, as well as the logical addresses used for swapping out the process.

7. No

8. No

9. No.

10.

- The TLB is a cache that contains those page table entries that have been most recently used. Its purpose is to avoid, most of the time, having to go to disk to retrieve a page table entry.