[Q.1.]

[a]

→ An Operating System is a Software System that manages hardware and provides an interface for users to interact with the computer.

[Q.1.]

[b]

→ A process is a program that is currently being run by the computer, and thread is a lightweight version of a process that executes a portion of the process's code.

[Q.1.]

[c]

→ An operating System does:

Processes: Manages the activities of multiple processes.

Memory: Ensures all programs and processes have enough memory.

Files: Handles data, making sure users can store files.

Devices: Controls input devices like printers.

Security: Protects data and programs from hackers.

[Q.1.]

[d]

→ The kernel is an essential part of the OS that manages memory, the CPU, and other resources, acting as an intermediary between software and hardware.

[Q.2.]

[a]

→ Memory management involves allocating memory for processes. Types include:

Contiguous: where memory is allocated in continuous blocks.

Paged: The memory is split into small, equal parts called pages.

Segmented: Memory is split into unequal parts.

[Q.2.]

[b]

→ A deadlock is when two or more processes cannot continue because they are waiting on each other for resources. One way to handle deadlocks in the Banker's algo, which checks resource availability before assigning them.

[Q.2.]

[c]

→ Logical address is the address created during program execution, and physical address is the real memory address in RAM.

[Q.2.]

[d]

→ System calls let Programs request Services like reading from a file or creating new processes.

[Q.3.]

[a]

→ File systems includes:

FAT32: older system with some limitations.

NTFS: more advanced with supports larger files.

EXT4: Used in Linux and supports large files.

[Q.3.]

[b]

→ CPU Scheduling helps decide which process gets CPU time.

Algorithms include:

FCFS: First process is in first served.

Round Robin: Each process gets a time slice.

SJN: Shortest task is completed first.

[Q.3.]

[c]

→ Virtual memory helps systems with not enough physical memory by using the hard drive as temporary storage for active processes.