Assignment 6 - Operating Systems Results for Harish Marepalli (He/Him)

⚠ Correct answers are hidden.

Score for this attempt: **11** out of 15 *

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This attempt took 3 minutes.

Question 1	Not yet graded / 4 pts

List four important functions of an operating system

Your Answer:

Below are the four important functions of an operating system.

1. Input/output management:

One of the critical functions of the operating system is to handle the computer's input/output (I/O) operations, which involve communicating with various devices such as keyboards, mice, displays, printers, and network interfaces. To facilitate the interaction between programs and these devices, the operating system offers various mechanisms such as device drivers, file systems, and network protocols. These mechanisms enable programs to access and utilize the devices efficiently and consistently.

Moreover, the operating system provides buffering and caching mechanisms that further enhance I/O performance and reduce latency. By temporarily storing data in a buffer or cache, the operating system can optimize the I/O process and minimize the time required to access the devices. This ensures that the programs can efficiently use the I/O devices without causing delays or disruptions in other system activities.

2. Resource management:

The allocation and management of computer hardware resources are among the essential responsibilities of an operating system. The operating system is responsible for allocating resources such as the CPU, memory, storage, and input/output devices to various programs or

processes based on their needs, priority, and availability. This ensures that the system resources are used optimally and efficiently.

Moreover, the operating system enables multiple programs to run simultaneously without interfering with each other or causing conflicts. It provides mechanisms to allocate resources to programs in a way that ensures their proper functioning while avoiding contention between them. This enables users to run multiple programs at the same time without affecting the overall performance of the system.

3. Process management:

The management of program execution is another critical function of an operating system. The operating system is responsible for creating, scheduling, and terminating processes as per the system or user requirements. In addition, the operating system provides tools for inter-process communication (IPC) and synchronization. These mechanisms enable processes to work in tandem, coordinate their activities, and share data effectively.

The ability to manage process execution is essential for ensuring the smooth functioning of the system. By allocating resources and managing processes efficiently, the operating system can maximize system performance and utilization. Moreover, the IPC and synchronization mechanisms facilitate the coordination of different processes, leading to enhanced efficiency and productivity.

4. Memory management:

The management of memory resources is a critical responsibility of the operating system. It encompasses the allocation and deallocation of both physical and virtual memory to processes based on their requirements. Additionally, the operating system provides mechanisms for memory protection, which ensure that processes cannot access the memory of other processes or the kernel's memory.

By efficiently managing memory resources, the operating system ensures that programs can run without facing memory constraints. The allocation and deallocation of memory are essential for avoiding memory leaks and ensuring optimal system performance. Moreover, memory protection mechanisms are critical for maintaining the integrity and security of the system, protecting it against malicious attacks and software errors.

Question 2   1 / 1 pts

Job Control Programs:

⦿ Allowed users to make more efficient use of computers

○ Were developed in the 1970s to support shared computers

○ Reduced memory requirements by allowing shared code

○ Created a separate process for each job

Question 3   1 / 1 pts

The operating system function that determines which process to execute next is called the _____ ?

> scheduler

Question 4   1 / 1 pts

The hardware mechanism to pause the currently executing program and transfer control to a "handler" is called _____ .

> interrupt

Question 5

1 / 1 pts

In a POSIX system, the exec() function:

◉ Overlays the calling program with the designated program, while retaining the same process ID

○ Launches a new process and runs the designated program

○ Duplicates the current process, resulting in 2 running processes

○ Loads a new program and waits for its completion

Question 6

1 / 1 pts

A modern I/O subsystem:

○ Has an I/O process to handle all pending I/O operations

◉ Relies on interrupts to notify it of I/O completiom

○ Relies on the central processor to perform I/O operations

○ Allows a program to continue executing while its I/O requests are processed

Question 7

1 / 1 pts

Which of the following is NOT true?

- ⦿ An MMU is required to implement a multi-process operating system

- ○ An MMU protects the memory fo each process from other processes

- ○ An MMU allows each process to have its own address space

- ○ An MMU supports the implementation of virtual memory by tracking "pages" that are not in physical memory

Question 8   2 / 2 pts

Place the following operations in order of speed (1 = fastest, 4 - slowest):

Accessing sequential data from the current position on disk	2
Accessing data on another disk track	4
Accessing data in memory	1
Accessing data from the current disk track	3

Question 9   1 / 1 pts

Kernel Mode:

○ Cannot be implemented on a multiprocessor operating system

◉ Allows access to system data structures and restricted instructions

○ Can only be accessed from system processes

○ Should be used as widely as possible to improve system performance

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Question 10   1 / 1 pts

Periodic cleanup of a disk is required because:

○ Portions of the disk wear out from frequent use, so disk space needs to be redistributed

○ Using disks for virtual memory randomizes the placement for files on disk

◉ Files become fragmented on disk due to frequent additions and deletions

○ Sharing files in a network operating system causes fragmenttaion

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Question 11   1 / 1 pts

Semaphores are used by the operating system to:

○ Prioritize processes

○ Allow user processes to communicate

○ Prevent memory fragmentation

◉ Prevent simultaneous access to critical resources

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