

Chapter 2 – Operating System OverviewTrue / False Questions:

1. An operating system controls the execution of applications and acts as an interface between applications and the computer hardware.
2. The operating system maintains information that can be used for billing purposes on multi-user systems.
3. The operating system typically runs in parallel with application programs, on its own special O/S processor.
4. One of the driving forces in operating system evolution is advancement in the underlying hardware technology.
5. In the first computers, users interacted directly with the hardware and operating systems did not exist.
6. In a batch-processing system, the phrase “control is passed to a job” means that the processor is now fetching and executing instructions in a user program.
7. Uniprogramming typically provides better utilization of system resources than multiprogramming.
8. In a time sharing system, a user’s program is preempted at regular intervals, but due to relatively slow human reaction time this occurrence is usually transparent to the user.
9. A process can be defined as a unit of activity characterized by a single sequential thread of execution, a current state, and an associated set of system resources.
10. A virtual memory address typically consists of a page number and an offset within the page.
11. Implementing priority levels is a common strategy for short-term scheduling, which involves assigning each process in the queue to the processor according to its level of importance.
12. Complex operating systems today typically consist of a few thousand lines of instructions.
13. A monolithic kernel architecture assigns only a few essential functions to the kernel, including address spaces, interprocess communication and basic scheduling.
14. The hardware abstraction layer (HAL) maps between generic hardware commands/responses and those unique to a specific platform.
15. Linux is one example of a modern UNIX system that implements a modular architecture.

Multiple Choice Questions:

1. A primary objective of an operating system is:
 - a. Convenience
 - b. Efficiency
 - c. Ability to evolve
 - d. All of the above
2. The operating system provides many types of services to end-users, programmers and system designers, including:
 - a. Built-in user applications

- b. Error detection and response
 - c. Relational database capabilities with the internal file system
 - d. All of the above
3. The operating system is unusual in its role as a control mechanism, in that:
- a. It runs on a special processor, completely separated from the rest of the system
 - b. It frequently relinquishes control of the system processor and must depend on the processor to regain control of the system
 - c. It never relinquishes control of the system processor
 - d. None of the above
4. Operating systems must evolve over time because:
- a. Hardware must be replaced when it fails
 - b. Users will only purchase software that has a current copyright date
 - c. New hardware is designed and implemented in the computer system
 - d. All of the above
5. A major problem with early serial processing systems was:
- a. Setup time
 - b. Lack of input devices
 - c. Inability to get hardcopy output
 - d. All of the above
6. An example of a hardware feature that is desirable in a batch-processing system is:
- a. Privileged instructions
 - b. A completely accessible memory area
 - c. Large clock cycles
 - d. None of the above
7. A computer hardware feature that is vital to the effective operation of a multiprogramming operating system is:
- a. Very large memory
 - b. Multiple processors
 - c. I/O interrupts and DMA
 - d. All of the above
8. The principle objective of a time sharing, multiprogramming system is to:
- a. Maximize response time
 - b. Maximize processor use
 - c. Provide exclusive access to hardware
 - d. None of the above
9. Which of the following major line of computer system development created problems in timing and synchronization that contributed to the development of the concept of the process?
- a. Multiprogramming batch operation systems
 - b. Time sharing systems
 - c. Real time transaction systems
 - d. All of the above
10. The paging system in a memory management system provides for dynamic mapping between a virtual address used in a program and:

- a. A virtual address in main memory
 - b. A real address in main memory
 - c. A real address in a program
 - d. None of the above
11. Relative to information protection and security in computer systems, access control typically refers to:
- a. Proving that security mechanisms perform according to specification
 - b. The flow of data within the system
 - c. Regulating user and process access to various aspects of the system
 - d. None of the above
12. A common problem with full-featured operating systems, due to their size and difficulty of the tasks they address, is:
- a. Chronically late in delivery
 - b. Latent bugs that show up in the field
 - c. Sub-par performance
 - d. All of the above
13. A technique in which a process, executing an application, is divided into threads that can run concurrently is called:
- a. Multithreading
 - b. Multiprocessing
 - c. Symmetric multiprocessing (SMP)
 - d. None of the above
14. WIN2K supports several types of user applications, including:
- a. WIN32
 - b. Linux
 - c. System 10
 - d. None of the above
15. Key to the success of Linux has been its character as a free software package available under the auspices of the:
- a. World Wide Web Consortium
 - b. Free Software Foundation
 - c. Berkeley Software Distribution
 - d. None of the above

Fill-In-The-Blank Questions:

1. The operating system's _____ refers to its inherent flexibility in permitting functional modifications to the system without interruption of services.
2. The operating system masks the details of the _____ from the application programmer.
3. The _____ is the portion of the operating system that remains in main memory during system operation.
4. An operating system should be _____ in construction, allowing it greater flexibility in the evolutionary process.
5. The earliest computers employed _____ processing, a name derived by the way the users were forced to access the systems.

6. The special type of programming language used to provide instructions to a monitor in a batch-processing scheme is called _____.
7. The central theme of modern operating systems, based on the concept of switching among multiple programs in memory, is called _____.
8. In a time-sharing, multiprogramming system, users interact with the system through _____.
9. A process consists of three elements: an executable program, associated data, and a(n) _____, which includes all information needed by the operating system and processor to manage and execute the process.
10. _____ is a facility that allows programs to address memory from a logical point of view, without regard to the physical amount of main memory.
11. The _____ queue in the operating system scheduling system consists of processes that are in main memory.
12. The interface to an operating system is often referred to as a _____, because it separates the user from O/S details and presents the O/S simply as a collection of services.
13. A _____ operating system provides the illusion of a single main memory space and a single secondary memory space, plus other unified access facilities.
14. The executive, protected subsystems and applications in a WIN2K system are structured using the _____ computing model, which is a common model for distributed computing.
15. Most UNIX systems are _____, in that they include virtually all of the O/S functionality in a single large block of code that runs in a single process with a single address space.