Chapter 2 – Operating System Overview

TRUE/FALSE QUESTIONS:

1) An OS should be constructed in such a way as to permit the effective development, testing, and introduction of new system functions without interfering with service.

Answer: True False

2) The OS masks the details of the hardware from the programmer and provides the programmer with a convenient interface for using the system.

Answer: True False

3) The ABI gives a program access to the hardware resources and services available in a system through the user ISA.

Answer: True False

4) The OS frequently relinquishes control and must depend on the processor to allow it to regain control.

Answer: True False

5) One of the driving forces in operating system evolution is advancement in the underlying hardware technology.

Answer: True False

6) The processor itself is not a resource so the OS is not involved in determining how much of the processor time is devoted to the execution of a user program.

Answer: True False

7) A process consists of three components: an executable program, the associated data needed by the program, and the execution context of the program.

Answer: True False

8) Uniprogramming typically provides better utilization of system resources than multiprogramming.

Answer: True False

9) A monolithic kernel is implemented as a single process with all elements sharing the same address space.

Answer: True False

10) The user has direct access to the processor with a batch-processing type of OS.
   Answer: True False

11) Both batch processing and time sharing use multiprogramming.
   Answer: True False

12) The phrase "control is passed to a job" means that the processor is now fetching and executing instructions from the monitor program.
   Answer: True False

13) 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.
   Answer: True False

14) The principle objective of Batch Multiprogramming is to minimize response time.
   Answer: True False

15) Virtualization technology enables a single PC or server to simultaneously run multiple operating systems or multiple sessions of a single OS.
   Answer: True False

MULTIPLE CHOICE QUESTIONS:

1) The ________ is the interface that is the boundary between hardware and software.

   A) ABI   B) ISA   C) IAS   D) API

   Answer: B

2) A(n) ________ is a set of resources for the movement, storage, and processing of data and for the control of these functions.

   A) architecture   B) program   C) computer   D) application

   Answer: C
3) The operating system’s _________ refers to its inherent flexibility in permitting functional modifications to the system without interfering with service.

   A) efficiency                     B) ability to evolve
   C) controlled access             D) convenience

Answer: B

4) Operating systems must evolve over time because:

   A) new hardware is designed and implemented in the computer system
   B) hardware must be replaced when it fails
   C) hardware is hierarchical
   D) users will only purchase software that has a current copyright date

Answer: A

5) A special type of programming language used to provide instructions to the monitor is _________.

   A) FPL                            B) JCL
   C) DML                           D) SML

Answer: B

6) Hardware features desirable in a batch-processing operating system include memory protection, timer, privileged instructions, and _________.

   A) clock cycles                  B) associated data
   C) interrupts                    D) kernels

Answer: C

7) A user program executes in a _________, in which certain areas of memory are protected from the user’s use, and in which certain instructions may not be executed.

   A) kernel mode                   B) user mode
   C) task mode                     D) batch mode

Answer: B

8) Multiprogramming operating systems are fairly sophisticated compared to single-program or _________ systems.

   A) uniprogramming                B) time-sharing
   C) multitasking                  D) memory management

Answer: A
9) One of the first time-sharing operating systems to be developed was the __________
   .
   A) Compatible Time-Sharing System
   B) Real Time Transaction System
   C) Multiple-Access System
   D) Multiprogramming Operation System

Answer: A

10) The technique where a system clock generates interrupts, and at each clock interrupt
    the OS regains control and assigns the processor to another user, is __________.
    
    A) time slicing
    B) multithreading
    C) round robin
    D) clock cycle

Answer: A

11) The __________ is the internal data by which the OS is able to supervise and control
    the process.
    
    A) executable program
    B) associated data
    C) nucleus
    D) execution context

Answer: D

12) __________ is where the OS must prevent independent processes from interfering
    with each other's memory, both data and instructions.
    
    A) Support of modular programming
    B) Process isolation
    C) Automatic allocation and management
    D) Protection and access control

Answer: B

13) __________ is concerned with the proper verification of the identity of users and the
    validity of messages or data.
    
    A) Availability
    B) Confidentiality
    C) Authenticity
    D) Data integrity

Answer: C

14) A common strategy to give each process in the queue some time in turn is referred
    to as a __________ technique.
    
    A) multithreading
    B) round-robin
    C) time slicing
    D) serial processing

Answer: B
15) The key to the success of Linux has been its character as a free software package available under the auspice of the __________.

A) World Wide Web Consortium  
B) Free Software Foundation  
C) Berkeley Software Distribution  
D) GNU Public License

Answer: B

SHORT ANSWER QUESTIONS:

1) An __________ is a program that controls the execution of application programs and acts as an interface between applications and the computer hardware.

Answer: operating system (OS)

2) The portion of the monitor that is always in main memory and available for execution is referred to as the _________.

Answer: resident monitor

3) __________ is a technique in which a process, executing an application, is divided into threads that can run concurrently.

Answer: Multithreading

4) Two major problems with early serial processing systems were scheduling and __________.

Answer: setup time

5) The central idea behind the simple batch-processing scheme is the use of a piece of software known as the _________.

Answer: monitor

6) Any resource allocation and scheduling policy must consider three factors: Fairness, Differential responsiveness, and __________.

Answer: Efficiency

7) A __________ is set at the beginning of each job to prevent any single job from monopolizing the system.

Answer: timer

8) The OS has five principal storage management responsibilities: process isolation, automatic allocation and management, support of modular programming, protection and access control, and __________.

Answer: long-term storage
9) The earliest computers employed __________ processing, a name derived by the way the users have access to the systems.

Answer: serial

10) __________ was designed to keep the processor and I/O devices, including storage devices, simultaneously busy to achieve maximum efficiency.

Answer: Multiprogramming

11) In a time-sharing, multiprogramming system, multiple users simultaneously access the system through __________.

Answer: terminals

12) The principal objective of __________ is to maximize processor use.

Answer: Batch Multiprogramming

13) Three major lines of computer system development created problems in timing and synchronization that contributed to the development of the concept of the process: multiprogramming batch operation, time sharing, and __________.

Answer: real-time transaction systems

14) __________ is a facility that allows programs to address memory from a logical point of view, without regard to the amount of main memory physically available.

Answer: Virtual memory

15) Security and protection as it relates to operating systems is grouped into four categories: Availability, Data integrity, Authenticity, and __________.

Answer: Confidentiality