Chapter 2 – Operating System Overview

<u>**TRUE/FALSE QUESTIONS:**</u>

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