Operating System

第一章 2024.9.5

1. The general role of an operating system is to:
   A. Act as an interface between various computers
   B. Provide a set of services to system users
   C. Manage files for application programs
   D. None of the above
2. Information that must be saved prior to the processor transferring control to the interrupt handler routine includes:
   A. Processor status word (PSW)
   B. Processor status word (PSW) & location of next instruction
   C. Processor status word (PSW) & contents of processor registers
   D. None of the above
3. One accepted method of dealing with multiple interrupts is to:
   A. Define priorities for the interrupts
   B. Disable all interrupts except those of highest priority
   C. Service them in round-robin fashion
   D. None of the above
4. In a uniprocessor system, multiprogramming increases processor efficiency by:
   A. Increasing processor speed
   B. Taking advantage of time wasted by long wait interrupt handling
   C. Eliminating all idle processor cycles
   D. All of the above
5. As one proceeds down the memory hierarchy (i.e., from inboard memory to offline storage), the following condition(s) apply:
   A. Increasing cost per bit
   B. Decreasing capacity
   C. Increasing access time
   D. All of the above
6. Small, fast memory located between the processor and main memory is called:
   A. Worm memory
   B. Cache memory
   C. CD-RW memory
   D. None of the above
7. When a new block of data is written into cache memory, the following determines which cache location the block will occupy:
   A. Block size
   B. Cache size
   C. Write policy
   D. None of the above
8. The four main structural elements of a computer system are:
   A. Processor, registers, I/O modules & main memory

B. Processor, registers, main memory & system bus
C. Processor, main memory, I/O modules & system bus
D. None of the above

9. The two basic types of processor registers are:
   A. User-visible and control/status registers
   B. Control and status registers
   C. User-visible and user-invisible registers
   D. None of the above
10. Address registers may contain:
   A. Memory addresses of data
   B. Memory addresses of instructions
   C. Partial memory addresses
   D. All of the above
11. A control/status register that contains the address of the next instruction to be fetched is called the:
   A. Instruction register (IR)
   B. Program counter (PC)
   C. Program status word (PSW)
   D. All of the above
12. The two basic steps used by the processor in instruction processing are:
   A. Fetch and instruction cycles
   B. Instruction and execute cycles
   C. Fetch and execute cycles
   D. None of the above
13. A fetched instruction is normally loaded into the:
   A. Instruction register (IR)
   B. Program counter (PC)
   C. Accumulator (AC)
   D. None of the above
14. A common class of interrupts is:
   A. Program
   B. Timer
   C. I/O
   D. All of the above
15. When an external device becomes ready to be serviced by the processor, the device sends this type of signal to the processor:
   A. Interrupt signal
   B. Halt signal
   C. Handler signal
   D. None of the above
16. About Intel Core i7-11700K, which statement is correct?
   A. It has eight physical cores and sixteen logical processors.
   B. It supports for Hyper-Threading technology.
   C. It is capable of handling sixteen threads, meaning each physical core can

process two threads.

D. All of above.

第二章 2024.9.12

1. A primary objective of an operating system is:
   A. Convenience
   B. Efficiency
   C. Ability to evolve
   D. All of the above
2. Which of the following major lines 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
3. The principal 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
4. 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
5. An example of a hardware feature that is desirable in a batch-processing system (批处理) is:
   A. Privileged instructions
   B. A completely accessible memory area
   C. Large clock cycles
   D. None of the above
6. 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
7. 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
8. 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

9. 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
10. 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
11. Win2K supports several types of user applications, including:
   A. Win32
   B. Linux
   C. System 10
   D. None of the above
12. 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
13. 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
14. 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
15. 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

第三章 2024.9.19

1. The process image element that contains the collection of attributes needed by the OS to control a particular process is called the:
   A. user data
   B. system stack
   C. process control block
   D. none of the above
2. A memory table is an OS control structure that is used by the OS to:
   A. manage I/O devices
   B. manage processes
   C. provide information about system files
   D. none of the above memory table Allocation of main memory and second memory to processes
3. The scheduling strategy where each process in the queue is given a certain amount of time, in turn, to execute and then returned to the queue, unless blocked, is referred to as:
   A. prioritization
   B. round-robin
   C. LIFO
   D. all of the above
4. In a process model that implements two suspend states, a valid state transition is represented by:
   A. ready/suspend -> ready
   B. running -> ready/suspend
   C. ready -> ready/suspend
   D. all of the above
5. In the five-state process model, the following represents a valid state transition:
   A. running -> blocked
   B. new -> running
   C. new -> blocked
   D. all of the above
6. There are a number of conditions that can lead to process termination, including: termination
   A. normal completion
   B. bounds violation
   C. parent termination
   D. all of the above
7. The basic two-state process model defines two possible states for a process in relationship to the processor:
   A. running and executing
   B. running and not running

C. executing and waiting
D. none of the above

8. The behavior of an individual process can be characterized by examining:
A. a single process trace
B. multiple process traces
C. the interleaving of the process traces
D. all of the above

9. In a typical UNIX system, the element of the process image that contains the processor status information is the:
A. system-level context
B. register context
C. user-level context
D. all of the above

10. In the process-based OS:
A. major kernel functions are organized as separate functions
B. the user process image includes a kernel stack
C. OS code and data are contained in the shared address space
D. none of the above

11. A process switch may occur when the system encounters an interrupt condition, such as that generated by a:
A. interrupt
B. supervisor call
C. trap
D. all of the above

12. One step in the procedure for creating a new process involves:
A. initializing the process control block
B. allocating space for the process
C. assigning a unique identifier
D. all of the above

13. The processor execution mode that user programs typically execute in is referred to as:
A. user mode
B. system mode
C. kernel mode
D. none of the above

14. The process image element that contains the modifiable part of the user space is called the:
A. user program
B. system stack
C. process control block
D. none of the above

15. The behavior of a processor can be characterized by examining:
A. a single process trace
B. multiple process traces

C. the interleaving of the process traces

D. all of the above

16. In modern operating systems, what is the basic unit of resource allocation and what is the basic unit of CPU dispatching?

A. Memory; Thread

B. Process; Task

C. Thread; Process

D. Process; Thread

第四章

17. Which of the following is true regarding the relationship between process and thread:

A. It takes far less time to create a new thread in an existing process than to create a new process

B. It takes less time to switch between two different processes than to switch between two threads within the same process

C. It takes less time to terminate a process than a thread

D. All of the above

18. One of the disadvantages of User-Level Threads (ULTs) compared to Kernel-Level Threads (KLTs) is:

A. Scheduling is application-specific

B. Thread switching does not require kernel mode privileges

C. When a ULT executes a system call, all threads in the process are blocked

D. All of the above

第五章 2024.10.10

1. A basic echo procedure running on a multiprocessor system can produce erroneous output if:

A.two processes deadlock while in the echo code

B. access to the echo procedure is unsynchronized

C. access to the echo procedure is synchronized

D. none of the above

2. Examples of solutions to the concurrency problem that do not involve busy waiting are the following:

A. producers and consumers

B. semaphores and monitors

C. message passing and caching

D. none of the above

3. A reason why the producer/consumer problem cannot be considered a special case of the reader/writer problem with a single writer and a single reader is:

A. the producer and consumer must be both reader and writer

B. the consumer must perform writes while the reader performs reads

C. the producer/consumer problem doesn’t deal with concurrency issues

D. none of the above

4. The reader/writer problem requires that certain conditions be satisfied, such as:
   A. any number of readers may simultaneously read from the file
   B. readers may read from the file while writers are writing to it
   C. multiple writers may write to the file simultaneously
   D. none of the above
5. In a system employing message passing, the typical message is divided into two primary sections:
   A. header and mailbox
   B. body and mailbox
   C. destination ID and source ID
   D. none of the above
6. In a system employing message passing, when a message is sent to a shared temporary data structure, this general approach is known as:
   A. indirect addressing
   B. direct addressing
   C. blocking
   D. none of the above
7. In synchronization involving message passing, the sender of a message can be:
   A. either blocking or non-blocking
   B. only blocking
   C. only non-blocking
   D. all of the above
8. A chief characteristic of a monitor is:
   A. a maximum of two processes may be executing in a monitor at a time
   B. a process enters the monitor by invoking one of its procedures
   C. local data variables of the monitor are accessible by any procedure requesting use of the monitor
   D. all of the above
9. The finite circular buffer is used to implement which of the following basic queuing strategies:
   A. FIFO
   B. LIFO
   C. FILO
   D. none of the above
10. A semaphore that does not specify the order in which processes are removed from the queue is called a:
   A. weak semaphore
   B. strong semaphore
   C. binary semaphore
   D. none of the above
11. In a uniprocessor system, mutual exclusion can be guaranteed by:
   A. disabling interrupts
   B. interleaving processes
   C. overlapping processes

D. all of the above

12. Processes that are designed to be able to pass execution control back and forth between themselves are referred to as:

A. busy waiting processes

B. threads

C. coroutines

D. none of the above

13. The following requirement must be met by any facility or capability that is to provide support for mutual exclusion:

A. a process remains in its critical code section for a finite time only

B. only one process at a time can be allowed into a critical code section

C. no assumptions can be made about relative process speeds

D. all of the above

14. In order to implement mutual exclusion on a critical resource for competing processes, only one program at a time should be allowed:

A. to perform message passing

B. to exhibit cooperation

C. in the critical section of the program

D. none of the above

16. Which of the following operations causes the CPU to switch from system mode to user mode?

A. Request for I/O

B. Scheduling

C. Waking up a process √

D. System call

第六章

1. A conservative strategy for dealing with deadlocks that involves limiting access to resources and imposing restrictions on processes is called:

A. deadlock detection

B. deadlock prevention

C. deadlock avoidance

D. none of the above

2. In the resource allocation denial approach to deadlock avoidance, a safe state is defined as one in which:

A. several potential process sequences do not result in a deadlock

B. all potential process sequences do not result in a deadlock

C. at least one potential process sequence does not result in a deadlock

D. none of the above

3. A direct method of deadlock prevention is to prevent the occurrence of:

A. hold and wait

B. circular wait

C. mutual exclusion

D. all of the above

4. A condition of policy that must be present for a deadlock to be possible is:
   A. hold and wait
   B. no preemption
   C. mutual exclusion
   D. all of the above
5. An example of a consumable resource is the following:
   A. messages
   B. main memory
   C. printers
   D. all of the above
6. A resource that can be created and destroyed is called a:
   A. reusable resource
   B. producible resource
   C. consumable resource
   D. all of the above
7. All deadlocks involve conflicting needs for resources by:
   A. two or more processes
   B. three or more processes
   C. one or more processes
   D. none of the above
8. The family of synchronization objects implemented by W2K include:
   A. mutex objects
   B. semaphore objects
   C. event objects
   D. all of the above
9. Thread synchronization primitives supported by Solaris include:
   A. condition variables
   B. semaphores
   C. mutual exclusion (mutex) locks
   D. all of the above
10. A software mechanism that informs a process of the occurrence of asynchronous events in UNIX are called:
   A. messages
   B. signals
   C. pipes
   D. all of the above
11. The dining philosopher's problem is a standard test case for evaluating approaches to implementing:
   A. deadlock
   B. starvation
   C. synchronization
   D. all of the above
12. One approach to an integrated strategy for dealing with deadlocks involves the implementation of:

A. virtual memory
B. process rollbacks
C. resource classes
D. none of the above

13. In deadlocked process recovery, selection criteria for choosing a particular process to abort or rollback includes designating the process with the:
A. lowest priority
B. least total resources allocated so far
C. most estimated time remaining
D. all of the above

14. The permanent blocking of a set of processes that either compete for system resources or communicate with each other is called:
A. deadlock
B. starvation
C. prioritization
D. all of the above

第七章

1. In the dynamic partitioning technique of memory management, the placement algorithm that scans memory from the location of the last placement and chooses the next available block that is large enough to satisfy the request is called:
A. best-fit
B. next-fit
C. first-fit
D. all of the above

2. In the dynamic partitioning technique of memory management, the placement algorithm that chooses the block that is closest in size to the request is called:
A. next-fit
B. first-fit
C. best-fit
D. all of the above

3. In the dynamic partitioning technique of memory management, the phenomenon that results in unused blocks of memory outside of existing partitions is called:
A. compaction
B. external fragmentation
C. internal fragmentation
D. none of the above

4. The problem of internal fragmentation can be lessened in systems employing a fixed-partition memory management scheme by using:
A. random size partitions
B. unequal size partitions
C. equal size partitions
D. none of the above

5. A problem with the largely obsolete fixed partitioning memory management

technique is that of:

A. inefficient use of memory
B. internal fragmentation
C. allowing only a fixed number of processes
D. all of the above

6. The concept of virtual memory is based on one or both of two basic techniques:

A. overlaying and relocation
B. segmentation and partitioning
C. segmentation and paging
D. none of the above

7. The practice in which a program and data are organized in such a way that various modules can be assigned the same region of memory is called:

A. overlaying
B. relocation
C. sharing
D. none of the above

8. The concept of memory management satisfies certain system requirements, including:

A. physical organization
B. relocation
C. protection
D. all of the above

9. In a system employing a segmentation scheme for memory management, a process is divided into:

A. one segment per thread
B. a number of segments which must be of equal size
C. a number of segments which need not be of equal size
D. none of the above

10. In a system employing a segmentation scheme for memory management, wasted space is due to:

A. external fragmentation
B. segments of different sizes
C. internal fragmentation
D. none of the above

11. In a system employing a paging scheme for memory management, wasted space is due to:

A. pages and frames of different specified sizes
B. external fragmentation
C. internal fragmentation
D. none of the above

12. The page table for each process maintains:

A. the physical memory location of the process
B. the frame location for each page of the process
C. the page location for each frame of the process

D. none of the above

13. An actual location in main memory is called a:

A. relative address

B. absolute address

C. logical address

D. none of the above

14. A reference to a memory location independent of the current assignment of data to memory is called a:

A. logical address

B. absolute address

C. relative address

D. none of the above

15. The task of subdividing memory between the OS and processes is performed automatically by the OS and is called:

A. memory management

B. relocation

C. protection

D. all of the above

第八章

1. The fetch policy that exploits the characteristics of most secondary memory devices, such as disks, which have seek time and rotational latency, is called:

A. swapping

B. demand paging

C. prepaging

D. none of the above

2. A fundamental choice in the design of the memory-management portion of an OS is:

A. whether or not to use virtual memory techniques

B. whether to use paging, segmentation, or a combination of the two

C. the algorithms employed for various aspects of memory management

D. all of the above

3. Sharing is achieved in a segmentation system by:

A. referencing a segment in the segment tables of more than one process

B. having a common data area that all processes can share

C. each process segment table having a reference to the dispatcher main memory area

D. all of the above

4. In a combined paging/segmentation system, a user's address space is broken up into a number of:

A. fixed-size pages, which are in turn broken down into variable-sized segments

B. variable-sized segments, which are in turn broken down into fixed-size pages

C. segments or pages, at the discretion of the programmer

D. all of the above

5. Segmentation has a number of advantages to the programmer over a non-segmented address space, including:

A. simplifying the handling of growing data structures

B. protection

C. sharing among processes

D. all of the above

6. The real address of a word in memory is translated from the following portions of a virtual address:

A. page number and frame number

B. frame number and offset

C. page number and offset

D. none of the above

7. The situation that occurs when the desired page table entry is not found in the translation lookaside buffer (TLB) is called a:

A. TLB hit

B. TLB miss

C. page fault

D. none of the above

8. The situation where the processor spends most of its time swapping process pieces rather than executing instructions is called:

A. the principle of locality

B. thrashing

C. paging

D. none of the above

9. The Windows 2000 virtual memory manager can use page sizes ranging from:

A. 4 KB to 64 KB

B. 64 KB to 4 GB

C. 4 GB to 4 TB

D. none of the above

10. The multi-level memory management scheme implemented in Linux was designed to minimize large page tables and directories in which of the following line of processors:

A. 16-bit x86 architecture

B. 64-bit alpha architecture

C. 32-bit Pentium/x86 architecture

D. none of the above

11. In SVR4 and Solaris systems, the memory management scheme that manages user processes and disk I/O is called the:

A. virtual memory manager

B. paging system

C. kernel memory allocator

D. none of the above

12. The concept associated with determining the number of processes that will be resident in main memory is referred to as:

A. the page fault frequency
B. a cleaning policy
C. load control
D. none of the above

13. The replacement policy that chooses only among the resident pages of the process that generated the page fault in selecting a page to replace is referred to as a:
A. local replacement policy
B. global replacement policy
C. variable replacement policy
D. none of the above

14. The replacement policy that is impossible to implement because it would require the OS to have perfect knowledge of future events is called the:
A. clock policy
B. optimal policy
C. least recently used (LRU) policy
D. none of the above

15. The type of memory that allows for very effective multiprogramming and relieves the user of memory size constraints is referred to as:
A. main memory
B. virtual memory
C. real memory
D. all of the above

16. Assume page size is 1k which is the correct virtual page number of virtual address 0x0D8A:
A. 0x0
B. 0x1
C. 0x2
D. 0x3 √

17. the practice in which a program and data are organized in such a way that various modules can be assigned the same region of memory is called:
A. overlaying √
B. sharing
C. swap
D. map

第九章

1. In the round robin scheduling technique, the principal design issue is:
A. determining the fair distribution of time quanta to individual processes
B. determining the length of the time quantum
C. determining the method of cycling through a given set of processes
D. none of the above

2. In terms of the queuing model, the total time that a process spends in a system

(waiting time plus service time) is called:

A. finish time (FT)
B. normalized turnaround time
C. turnaround or residence time
D. none of the above

3. Which of the following scheduling policies allow the OS to interrupt the currently running process and move it to the ready state?

A. preemptive
B. first-come-first-served
C. non-preemptive
D. none of the above

4. A typical way to overcome starvation of lower-priority processes in a priority-based scheduling system is to:

A. change a process priority with its age
B. change a process priority randomly
C. round-robin cycling of processes in a priority queue
D. all of the above

5. Response time in an interactive system is an example of:

A. system-oriented criteria for long-term scheduling policies
B. user-oriented criteria for short-term scheduling policies
C. system-oriented criteria for short-term scheduling policies
D. none of the above

6. In terms of frequency of execution, the short-term scheduler is usually the one that executes:

A. most frequently
B. about the same as the other schedulers
C. least frequently
D. none of the above

7. Typically, the swapping-in function for processes is based on the need to manage:

A. virtual memory
B. process priorities
C. the degree of multiprogramming
D. none of the above

8. The decision as to which job to admit to the system next can be based on which of the following criteria:

A. simple FIFO
B. I/O requirements
C. priority
D. all of the above

9. The traditional UNIX scheduler divides processes into fixed bands of priority levels, with the highest priority band being the:

A. file manipulation band
B. swapper band
C. user process band

D. none of the above

10. The strategy that schedules processes based on their group affiliation is generally referred to as:

A. simulation modeling

B. queuing analysis

C. fair share scheduling

D. all of the above

11. It is impossible to make definitive comparisons of various scheduling policies due to dependence on factors such as:

A. the probability distribution of service times of the various processes

B. the nature of the I/O demand and performance of the I/O subsystem

C. the efficiency of the scheduling and context switching mechanisms

D. all of the above

12. Which of the following scheduling policies require prior knowledge or estimation of process length:

A. highest response ratio next (HRRN)

B. shortest remaining time (SRT)

C. shortest process next (SPN)

D. all of the above

13. One difficulty with the shortest remaining time (SRT) scheduling technique is:

A. the starvation of shorter processes

B. the lack of preemption

C. the need to know or estimate required processing times for each process

D. all of the above

14. One difficulty with the shortest process next (SPN) scheduling technique is:

A. the need to know or estimate required processing times for each process

B. the starvation of longer processes

C. the lack of preemption

D. all of the above

15. The type of scheduling that involves the decision to add a process to those that are at least partially in main memory and therefore available for execution is referred to as:

A. I/O scheduling

B. long-term scheduling

C. medium-term scheduling

D. none of the above

16. About size of time quantum in RR, which statement is correct :(1.0 分)

A. Greater than typical interaction √

B. Less than typical interaction

C. Greater than typical I/O response

D. Less than typical I/O response

第十一章

1. The scenario where multiple buffers are used in an attempt to alleviate the problem of absorbing rapid bursts of I/O is typically referred to as:

A. double buffering
B. circular buffering
C. single buffering
D. none of the above

2. An example of a block-oriented I/O device is:
A. CD-ROM
B. modem
C. printer
D. all of the above

3. In a hierarchical structure for managing I/O on a secondary storage device that supports a file system, the layer that is closest to the hardware is the:
A. device I/O layer
B. directory management layer
C. physical organization layer
D. none of the above

4. The primary objective in designing the I/O facility of a computer system that deals with the desire to handle all I/O devices in a uniform manner is referred to as:
A. generality
B. directory management
C. efficiency
D. none of the above

5. The bus configuration for DMA that provides no path other than the system bus between the DMA module(s) and I/O devices is:
A. I/O bus
B. single bus, integrated DMA-I/O
C. single bus, detached DMA
D. none of the above

6. The system configuration that includes an I/O module which is a separate processor with a specialized instruction set can be referred to using the following terminology:
A. I/O channel
B. I/O processor
C. direct memory access (DMA)
D. all of the above

7. The I/O technique where the processor busy waits for an I/O operation to complete is called:
A. interrupt-driven I/O
B. direct memory access (DMA)
C. programmed I/O
D. none of the above

8. In a W2K system, the I/O manager module that includes lazy write and lazy commit services to improve overall performance is the:
A. file system drivers
B. cache manager
C. hardware device drivers

D. none of the above

9. In a UNIX system, which of the following types of I/O devices make use of character queues:

A. communications lines

B. disk drive

C. tape drive

D. all of the above

10. The disk cache replacement strategy that replaces the block that has experienced the fewest references is called:

A. least recently used (LRU)

B. least frequently used (LFU)

C. least referenced (LR)

D. all of the above

11. Which of the following RAID levels implement some form of parity calculation to introduce redundancy:

A. RAID level 2

B. RAID level 4

C. RAID level 6

D. all of the above

12. The disk scheduling algorithm that implements two sub-queues in a measure to avoid the problem of “arm stickiness” is the:

A. FSCAN policy

B. C-SCAN policy

C. N-step-SCAN policy

D. all of the above

13. The following disk scheduling policy is useful as a benchmark against which to evaluate other disk scheduling policies because it provides a worst-case scenario:

A. FIFO scheduling

B. random scheduling

C. priority scheduling

D. none of the above

14. An example of the key differences that can exist across (and even in) classes of I/O devices is:

A. data representation

B. error conditions

C. data rate

D. all of the above

第十二章

1. Access rights on a file typically are considered to constitute a hierarchy, with each right implying those that:

A. precede it

B. supercede it

C. succeed it

D. none of the above

2. In a tree-structured directory, the series of directory names that culminates in a file name is referred to as the:
   A. symbolic name
   B. pathname
   C. working directory
   D. none of the above

3. The file directory information element that holds information such as the identity of the creator of the file is the:
   A. access control information element
   B. usage information element
   C. address information element
   D. all of the above

4. Direct or hashed files are often used where:
   A. very rapid access is required
   B. records are always accessed one at a time
   C. fixed length records are used
   D. all of the above

5. Indexed sequential files are similar to sequential files but contain two added features:
   A. hash function and an overflow file
   B. hash function and file index
   C. file index and overflow file
   D. all of the above

6. Sequential files are optimal in scenarios involving:
   A. applications that require infrequent updates
   B. applications that require frequent queries
   C. applications that require the processing of all records in the file
   D. all of the above

7. Record access in a pile file can be conducted by:
   A. partial index
   B. exhaustive search
   C. key field
   D. all of the above

8. The level of the file system architecture that enables users and applications to access file records is called the:
   A. logical I/O level
   B. basic file system level
   C. basic I/O supervisor level
   D. all of the above

9. In a W2K NTFS file system, the smallest physical storage unit on the disk (almost always 512 bytes) is called a:
   A. sector
   B. volume

C. cluster
D. none of the above

10. File allocation in a UNIX system has the following characteristics:
A. dynamic allocation using non-contiguous blocks with indexing
B. preallocation using non-contiguous blocks without indexing
C. dynamic allocation using contiguous blocks without indexing
D. none of the above

11. The data structure that maintains information on available disk space is called the:
A. disk allocation table
B. bit table
C. file allocation table (FAT)
D. none of the above

12. The technique of free disk space management that employs a pointer and length value of each free portion is the:
A. indexing
B. free block list
C. bit tables
D. none of the above

13. In which of the following file allocation methods is preallocation required:
A. contiguous
B. chained
C. indexed
D. none of the above

14. Fixed file blocking experiences the following potential problem:
A. internal fragmentation
B. gaps due to hardware design
C. external fragmentation
D. none of the above

15. A file is generally defined to be:
A. a collection of similar records
B. a collection of related fields
C. a basic element of data
D. all of the above

16. In a simple file system, each inode contains13 direct block pointers, 1 single-indirect block pointer, 1 double-indirect block pointer, and 1triple-indirect block pointer. Each data block size is 4KB, and each block pointer occupies 4 bytes. What is the maximum possible length of a file?:
A. 4GB+4MB+52KB
B. 8GB+4MB+52KB
C. 4TB+4GB+4MB+52KB √
D. None of the above