

Operating Systems: Scheduling & Storage (CCA-2-OSS)
Multiple-Choice Test 12/11/2003

Name:

Student Id.:

Read each question carefully, then **ring one letter** (a.) If you change your mind, cross it through ~~(a.)~~ and ring a different letter.

1. When a program is in execution, what action does the processor perform in order to fetch the next instruction?
 - a. Pop the address of the instruction from the stack.
 - b. Copy the contents of the PC to the MAR.
 - c. Look up the address of the instruction in the associated process control block.
 - d. Trap to the ISR.
2. Which one of the following statements concerning a TRAP instruction is true?
 - a. It is part of the WIN32 API.
 - b. It is used in the implementation of library functions that invoke system calls.
 - c. The processor is expected to be in supervisor mode before executing it
 - d. It is a POSIX.1 system call.
3. What is the purpose of dual-mode operation?
 - a. To enable the operating system to take control of the processor.
 - b. To save power.
 - c. To protect the operating system and hardware from corruption.
 - d. To distinguish an ordinary user from a super-user (administrator).
4. Which one of the following statements concerning storage devices is false?
 - a. In handling a cache miss, a block (rather than a single word) is transferred from the next level in the memory hierarchy.
 - b. Management of cache memory is the responsibility of the operating system.
 - c. A disk cache is implemented in main memory.
 - d. Main memory is volatile.
5. What are utilities?
 - a. Peripherals that are connected to a computer.
 - b. Operating system routines that execute in supervisor mode.
 - c. Data structures that are part of the kernel of an operating system.
 - d. Shells, compilers and other useful system programs.
6. What is POSIX?
 - a. A standard operating system interface and environment.
 - b. A version of the UNIX operating system.
 - c. A portable platform for Java programming.
 - d. A subsystem of Windows NT, 2000 and XP that isolates the Executive from platform-specific hardware differences.

7. Which one of the following operating systems was written for minicomputers?
 - a. MS-DOS 1.0
 - b. OS/360
 - c. UNIX version 7
 - d. Windows NT

8. Which technique was introduced because a single job could not keep both the CPU and the I/O devices busy?
 - a. Time-sharing.
 - b. Spooling.
 - c. Preemptive scheduling.
 - d. Multiprogramming.

9. Which one of the following statements correctly describes the relationship between the processes and programs in a computer system at any given moment?
 - a. Every program stored in secondary memory must be associated with a process.
 - b. A different program must be associated with every process.
 - c. Several programs may be associated with the same process.
 - d. Several processes may be associated with the same program.

10. Which one of the following state-transitions does not affect any “ready” queue?
 - a. Release.
 - b. Timeout.
 - c. Event occurs.
 - d. Admit.

11. Which kind of scheduling involves activation and suspension of processes?
 - a. Short-term.
 - b. Middle-term.
 - c. Long-term.
 - d. Prioritised.

12. Which one of the following statements about processes in UNIX is true?
 - a. A user process can temporarily become a system process.
 - b. A system process can be preempted.
 - c. An “exec” system call spawns a child process.
 - d. Parent and child processes share their data segments.

13. Which one of the following statements about kernel-level threads is true?
 - a. They are the unit of dispatch.
 - b. They are protected from each other within a process.
 - c. They share the same user stack within a process.
 - d. They share the same kernel stack within a process.

14. Which model for implementing a threads library has been adopted in most modern operating systems?
 - a. Pure user-level.
 - b. Pure kernel-level.
 - c. MxN.
 - d. Java.

15. Which threads library is available on POSIX-compliant systems?
 - a. Fibers.
 - b. C-threads.
 - c. Pthreads.
 - d. UI-threads.

16. Which one of the following statements about threads is false?
 - a. Creating a thread is faster than creating a process.
 - b. In the pure user-level model, if one thread blocks then all threads associated with the same process block.
 - c. In the pure kernel-level model, if one thread blocks then all threads associated with the same process block.
 - d. Threads can execute simultaneously if there are multiple processors.

17. What makes the behaviour of a multi-threaded program unpredictable?
 - a. It depends upon random numbers.
 - b. Execution switches from one thread to another outside the control of the program.
 - c. One cannot assume that loading and storing a word in memory is an atomic operation.
 - d. Programmers often make mistakes.

18. Why are shared variables in multi-threaded Java programs sometimes declared to be “volatile”?
 - a. To remind the programmer that they are dangerous.
 - b. To allow the JVM to invalidate them when power is turned off.
 - c. To enable more than one thread to access them.
 - d. To ensure that the most recent value written to such a variable is supplied to any thread accessing it.

19. Which one of the following operations cannot be used to acquire a lock on a resource?
 - a. Enabling interrupts.
 - b. Busy-waiting using test-and-set instruction.
 - c. Busy-waiting using exchange instruction.
 - d. Waiting on a semaphore.

20. How can a semaphore s be used to solve the critical-section problem?
 - a. Initialize s to 0; enter section after waiting on s ; exit after signaling on s .
 - b. Initialize s to 1; enter section after waiting on s ; exit after signaling on s .
 - c. Initialize s to 0; enter section after signaling on s ; exit after waiting on s .
 - d. Initialize s to 1; enter section after signaling on s ; exit after waiting on s .