

Exame Época Normal - Duração: 60 minutos

Notas:

- Em cada uma das perguntas existe apenas **uma** resposta correta
- Cada **três** respostas erradas anulam uma resposta correta
- Nota mínima de 7.5 valores

Nº: _____ Nome: _____

1) Which of the following is not true in Linux:

- (a) The kernel is the program that constitutes the central core of the operating system
- (b) The kernel is the first part of the operating system to load into memory during booting
- (c) The kernel is made of several modules that cannot be loaded during runtime
- (d) The kernel remains always in memory during the entire computer session

2) Which of the following are functions of the operating system: i) sharing hardware among users; ii) allowing users to share data; iii) recovering from errors; iv) preventing users from interfering with each other; v) scheduling resources among users.

- (a) i, ii, iii, and iv only
- (b) ii, iii, iv, and v only
- (c) i, iii, iv, and v only
- (d) All of these functions

3) _____ executes the most frequently and makes fine grained decisions of which process to execute next.

- (a) Long-term scheduler
- (b) Medium-term scheduler
- (c) Short-term scheduler
- (d) None of the above

4) Which of the following is not the function of a microkernel?

- (a) File management
- (b) Low-level memory management
- (c) Inter-process communication
- (d) I/O interrupts management

5) Match the following sentences:

- | | |
|----------------------------|---|
| i) Mutual exclusion | a) A process may hold allocated resources while waiting assignment |
| ii) Hold and wait | b) No resource can be forcibly removed from a process holding it |
| iii) No preemption | c) Only one process may use a resource at a time |
- (a) i-a, ii-b, iii-c
 - (b) ii-a, ii-c, iii-b
 - (c) i-b, ii-c, iii-a
 - (d) i-c, ii-a, iii-b

6) A direct method of deadlock prevention is to prevent the occurrence of:

- (a) Mutual exclusion
- (b) Hold and wait
- (c) Circular waits
- (d) No preemption

7) State whether the following statement is true: i) it takes less time to terminate a thread than a process; ii) threads enhance efficiency in communication between different executing programs.

- (a) i) is true, ii) is true
- (b) i) is true, ii) is false
- (c) i) is false, ii) is true
- (d) i) is false, ii) is false

8) _____ refers to the ability of multiple processes to share code, resources or data in such a way that only one process has access to the shared object at a time.

- (a) Synchronization
- (b) Mutual exclusion
- (c) Deadlock
- (d) Starvation

9) _____ establishes a set of scheduling queues and allocate processes to queues on execution history and other criteria.

- (a) Round robin
- (b) Shortest Job First
- (c) Shortest Remaining Time First
- (d) Multilevel Feedback Scheduling

10) Which of the following statements about FCFS scheduling are true: i) it tends to favor CPU bound processes over I/O bound processes; ii) it may result inefficient use of both the processor and I/O devices; iii) it is an attractive alternative on its own for a single processor system.

- (a) i and ii only
- (b) ii and iii only
- (c) i and iii only
- (d) All of these statements

11) What is the ready state of a process?

- (a) When the process is able to make progress but not using the CPU
- (b) When the process is unable to make progress until some task has been completed
- (c) When the process is using the CPU
- (d) None of the above

12) If all the processes in the system are I/O bound, the ready queue will almost always be _____, and the scheduler will have _____ to do.

- (a) full, little
- (b) full, a lot
- (c) empty, little
- (d) empty, a lot

13) In rate monotonic scheduling:

- (a) A shorter duration job has higher priority
- (b) A longer duration job has higher priority
- (c) The priority does not depend on the duration of the job
- (d) None of the above

14) Interrupts are provided primarily to:

- (a) Improve processor utilization
- (b) Improve processor control
- (c) Improve processor speed
- (d) Improve processor execution

15) The time duration required for the scheduler to stop one process and start another is known as:

- (a) Process latency
- (b) Dispatch latency
- (c) Execution latency
- (d) Interrupt latency

16) Several processes access and manipulate the same data concurrently and the outcome of the execution depends on the particular order in which the access takes place, is called a:

- (a) Dynamic condition
- (b) Critical section
- (c) Process synchronization condition
- (d) Race condition

17) In the many-to-one threading model, if a thread makes a blocking system call:

- (a) The entire process will be blocked
- (b) A part of the process will stay blocked, while the rest is able to run
- (c) The entire process will run
- (d) None of the above

18) Which changes to a system are likely to improve a system's throughput?

- (a) Using a simpler scheduler that takes less time to decide which process to run
- (b) Switching from a non-preemptive to a preemptive scheduling algorithm
- (c) Making context switches take more time
- (d) None of the above

19) Suppose we are writing a program where some processes are responsible for computing graphs and other processes are responsible for displaying them. We want the graph displaying processes to wait until a graph has been computed before it starts trying to display a graph. To implement this waiting using a semaphore, we could initialize the semaphore to _____, use the _____ operation after a process computes a graph, and use the _____ operation before a process displays a graph.

- (a) 1 / down / up
- (b) 1 / up / down
- (c) 0 / up / down
- (d) 0 / down / up

20) In lecture, we discussed multi-level feedback queue schedulers that attempts to adjust a process's priority based on the length of its CPU bursts. In such a scheduler, programs at the highest priority:

- (a) Have shorter timeslices than programs at any other priority
- (b) Are not allowed to use more total CPU time than the programs at lower priority
- (c) Will be demoted to a lower priority if they stop using the CPU before the end of their timeslice
- (d) None of the above