

**Chapter 9 – Uniprocessor Scheduling**True / False Questions:

1. Scheduling affects the performance of a system because it determines which processes will wait and which will progress.
2. The short-term scheduler may limit the degree of multiprogramming to provide satisfactory service to the current set of processes.
3. Medium-term scheduling is part of the system swapping function.
4. The long-term scheduler is invoked whenever an event occurs that may lead to the suspension or preemption of the currently running process.
5. The main objective of short-term scheduling is to allocate processor time in such a way as to optimize one or more aspects of system behavior.
6. One problem with a pure priority scheduling scheme is that lower-priority processes may suffer deadlock.
7. The selection function determines which process, among ready processes, is selected next for execution.
8. First-come-first-served (FCFS) is a simple scheduling policy that tends to favor I/O-bound processes over processor bound processes.
9. Round Robin is a scheduling technique is also known as time slicing, because each process is given a slice of time before being preempted.
10. The Shortest Process Next (SPN) scheduling policy is often used for time-sharing and transaction processing environments because of the lack of preemption.
11. The Shortest Remaining Time (SRT) scheduling policy is a preemptive version of the Shortest Process Next (SPN) scheduling policy.
12. In the Highest Response Ratio Next (HRRN) scheduling policy, longer jobs are favored, because they yield a larger ratio from the smaller denominator in the equation.
13. A disadvantage of simulation is that results for a given “run” only apply to that particular collection of processes under that particular set of assumptions.
14. In “fair share” scheduling, each user is assigned a weighting of some sort that defines that user’s share of system resources as a fraction of the total usage of those resources.
15. The traditional UNIX scheduler, such as those used in SVR3 and 4.3 BSD UNIX systems, employs single level feedback using round robin.

Multiple Choice Questions:

1. 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. Long-term scheduling
  - b. Medium-term scheduling
  - c. I/O scheduling
  - d. None of the above
2. 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. Priority
  - c. I/O requirements
  - d. All of the above
3. Typically, the swapping-in function for processes is based on the need to manage:
  - a. Process priorities
  - b. Virtual memory
  - c. The degree of multiprogramming
  - d. None of the above
4. In terms of frequency of execution, the short-term scheduler is usually the one that executes:
  - a. Most frequently
  - b. Least frequently
  - c. About the same as the other schedulers
  - d. None of the above
5. Response time in an interactive system is an example of:
  - a. System-oriented criteria for short-term scheduling policies
  - b. User-oriented criteria for short-term scheduling policies
  - c. System-oriented criteria for long-term scheduling policies
  - d. None of the above
6. A typical way to overcome starvation of lower-priority processes in a priority-based scheduling system is to:
  - a. Change a process priority randomly
  - b. Change a process priority with its age
  - c. Round-robin cycling of processes in a priority queue
  - d. All of the above
7. Which of the following scheduling policies allow the O/S to interrupt the currently running process and move it to the Ready state?
  - a. Preemptive
  - b. Non-Preemptive
  - c. First-come-first-served
  - d. None of the above
8. In terms of the queuing model, the total time that a process spends in a system (waiting time plus service time) is called:
  - a. Normalized turnaround time (TAT)
  - b. Finish time (FT)
  - c. Turnaround or residence time (TAT)
  - d. None of the above
9. In the Round Robin scheduling technique, the principle design issue is:
  - a. Determining the fair distribution of time quanta to individual processes
  - b. Determining the method of cycling through a given set of processes
  - c. Determining the length of the time quantum
  - d. None of the above
10. 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
11. One difficulty with the Shortest Remaining Time (SRT) scheduling technique is:
- a. The need to know or estimate required processing times for each process
  - b. The starvation of shorter processes
  - c. The lack of preemption
  - d. All of the above
12. Which of the following scheduling policies require prior knowledge or estimation of process length:
- a. Shortest Remaining Time (SRT)
  - b. Shortest Process Next (SPN)
  - c. Highest Response Ratio Next (HRRN)
  - d. All of the above
13. 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 efficiency of the scheduling and context switching mechanisms
  - c. The nature of the I/O demand and performance of the I/O subsystem
  - d. All of the above
14. The strategy that schedules processes based on their group affiliation is generally referred to as:
- a. Queuing analysis
  - b. Simulation modeling
  - c. Fair share scheduling
  - d. All of the above
15. The traditional UNIX scheduler divides processes into fixed bands of priority levels, with the highest priority band being the:
- a. Swapper band
  - b. File manipulation band
  - c. User process band
  - d. None of the above

Fill-In-The-Blank Questions:

1. The task of assigning processes to the processor or processors over time, in a way that meets system objectives is called \_\_\_\_\_.
2. The decision as to when to create a new process is generally driven by the desired degree of \_\_\_\_\_.
3. \_\_\_\_\_-term scheduling is part of the system swapping function.
4. The \_\_\_\_\_-term scheduler is invoked whenever an event occurs that may lead to the suspension or preemption of the currently running process.
5. Response time and throughput are examples of \_\_\_\_\_-related criteria for short-term scheduling
6. In a system employing priority scheduling, the scheduler always selects the process with the \_\_\_\_\_ priority level for processing.

7. The \_\_\_\_\_, which has two general categories, specifies the instants in time at which the selection function is exercised.
8. In terms of the queuing model, the total time that a process spends in a system (waiting time plus service time) is called the \_\_\_\_\_.
9. The Round Robin scheduling technique is also known as \_\_\_\_\_, because each process is given a set amount of processor time before being preempted.
10. \_\_\_\_\_ is a scheduling policy in which the process with the shortest expected processing time is selected next, but there is no preemption.
11. \_\_\_\_\_ is a scheduling policy in which the process with the shortest expected processing time is selected next, and if a shorter process becomes ready in the system, the currently running process is preempted.
12. A scheduling mechanism that requires no prior knowledge of process length, yet can nevertheless favor shorter jobs, is known as the \_\_\_\_\_ scheduling mechanism.
13. Some of the difficulties of analytic modeling are overcome by using \_\_\_\_\_, which allows a wide range of policies to be modeled.
14. In \_\_\_\_\_ scheduling, each user is assigned a weighting of some sort that defines that user's share of system resources as a fraction of the total usage of those resources.
15. The traditional UNIX scheduler, such as those used in SVR3 and 4.3 BSD UNIX systems, divides processes into fixed \_\_\_\_\_ of priority levels.