

**Chapter 3 – Process Description and Control**True / False Questions:

1. The principal function of the processor is to execute machine instructions residing in main memory.
2. A process trace is a listing of the sequence of instructions that execute for that process.
3. The principal responsibility of the operating system is to control the execution of processes.
4. When one process spawns another, the spawning process is referred to as the child process and the spawned process is referred to as the parent process.
5. Round-Robin processing refers to a method of thread prioritization for scheduling.
6. The primary difference between the Two-State Process Model and the Five-State Process Model is that the latter splits the Running state into two new states: Ready and Blocked.
7. One solution to the problem of limited main memory space is swapping, which involves moving all or part of a process from main memory to secondary memory.
8. In order to define the control structures (e.g., tables) that the O/S needs to manage processes and resources, it must have access to configuration data during initialization.
9. The Process Image refers to the binary form of the program code.
10. The portion of the Process Control Block that consists of the contents of the processor registers is called the Process Control Information.
11. The less-privileged processor execution mode is often referred to as kernel mode.
12. The primary process table contains one entry per process, unless the process spawns a new process, in which case the table contains multiple entries for the parent process.
13. One kind of system interrupt, the trap, relates to an error or exception condition in the currently running process.
14. In the Nonprocess Kernel approach to defining the relationship between the O/S and the User Process, the O/S code is executed as a separate entity that operates in privileged mode.
15. A typical UNIX system employs two Running states, to indicate whether the process is executing in user mode or kernel mode.

Multiple Choice Questions:

1. 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
2. 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

3. 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
4. There are a number of conditions that can lead to process termination, including:
  - a. Normal completion
  - b. Bounds violation
  - c. Parent termination
  - 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. 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
7. 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
8. A Memory Table is an O/S control structure that is used by the O/S to:
  - a. Manage I/O devices
  - b. Manage processes
  - c. Provide information about system files
  - d. None of the above
9. The Process Image element that contains the collection of attributes needed by the O/S to control a particular process is called the:
  - a. User Data
  - b. System Stack
  - c. Process Control Block
  - d. None of the above
10. 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

11. 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
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. A process switch may occur when the system encounters an interrupt condition, such as that generated by a:
  - a. Memory fault
  - b. Supervisor call
  - c. Trap
  - d. All of the above
14. In the Process Based O/S:
  - a. Major kernel functions are organized as separate functions
  - b. The User Process Image includes a kernel stack
  - c. O/S code and data are contained in the shared address space
  - d. None of the above
15. 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

Fill-In-The-Blank Questions:

1. The listing of a sequence of instructions that execute for a particular process is called a \_\_\_\_\_.
2. The behavior of a processor can be characterized by examining the interleaving of the process \_\_\_\_\_ for the processes currently running on the system.
3. The portion of the operating system that selects the next process to run is called the \_\_\_\_\_.
4. When the O/S creates a process at the explicit request of an existing process, the action is referred to as \_\_\_\_\_.
5. A process that cannot execute until some event occurs is said to be in the \_\_\_\_\_ state.
6. In a system that implements two suspend states, a process that has been swapped out of main memory and into secondary memory and that is also awaiting an event is in the \_\_\_\_\_ / \_\_\_\_\_ state.
7. 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 \_\_\_\_\_.

8. The O/S control structure that the O/S uses to manage system processes is called the \_\_\_\_\_.
9. The User Data, User Program, System Stack and Process Control Block elements collectively make up what is referred to as the \_\_\_\_\_.
10. The Process Identification, Processor State Information and the Process Control Information are the general categories that collectively make up what is referred to as the \_\_\_\_\_.
11. The processor typically maintains the current operating mode (i.e., user or kernel) in the \_\_\_\_\_.
12. The first step in creating a new process is to assign a unique \_\_\_\_\_ to the new process.
13. The execution of a user process may be interrupted by a \_\_\_\_\_, which might be generated by the process requesting an I/O operation.
14. In the \_\_\_\_\_ model for illustrating the relationship between the O/S and User Processes, the O/S has its own region of memory to use and its own system stack for controlling procedure calls and returns.
15. In the \_\_\_\_\_ model for illustrating the relationship between the O/S and User Processes, the O/S has its own region of memory to use and its own system stack for controlling procedure calls and returns.
16. Process creation in a typical UNIX system is made by means of a kernel system call named \_\_\_\_\_.