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Operating System MCQs

1. Which of the following are CPU scheduling algorithms?

2. Operating systems

3. A process which is copied from main memory to secondary memory on the basis of requirement is known as -

4. FIFO scheduling is a type of:

5. Which of the type of OS reads and reacts in terms of actual time?

6. A systematic procedure for moving the CPU to new process is known as-

7. UNIX is written in which language?

8. Thread is a

9. OS classifies the threads as-

10. Among the following CPU

Correct Answer

Multiple processes are run in parallel in CPU. Sometimes when a high priority process comes up, the kernel transfers control of the CPU to that process.

7. UNIX is written in which language?

- C#
- C++
- C
- .NET



Check Answer

8. Thread is a

- Light weight process
- Heavy weight process
- Multi-process
- I/O process

Check Answer

9. OS classifies the threads as-

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 Real mode, protected mode Direct mode, indirect mode

Hide

Wrong Answer

Two operating modes of AT are Real mode and protected mode.

12. Which of the following schedules threads?

 Virtual memory Operating system CPU Input

Hide

Correct Answer

Thread scheduling is done by OS.

13. What is meant by ready state of a process?

 When the process is scheduled to run after some execution When the process is currently using the CPU When the process is dependent of the execution time of some other process. None of these

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CPU Input

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- When the process is scheduled to run after some execution
- When the process is currently using the CPU
- When the process is dependent of the execution time of some other process.
- None of these

Wrong Answer
Ready state of the process means the process has all necessary resources which are required for execution of that process when CPU is allocated.

14. Among the following, which is an example of a spooled device?

- A line printer that prints the output of a number of jobs.
- A terminal that inputs user data
- A I/O device to display graphics.
- None

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Correct Answer

A disk driver is a device driver that allows a specific disk drive to communicate with the remainder of the computer. A good example of this driver is a floppy disk driver.

18. When are the register context and stack of thread deallocated?

- when the thread terminates
- when the thread blocks
- when the thread unblocks
- when the thread spawns

Check Answer

19. Threads is not shared among which of the following?

- stack
- program counter
- both program counter and stack
- none

Check Answer

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Hide

Wrong Answer

Register context and stack of thread are deallocated when the thread terminates.

19. Threads is not shared among which of the following?

- stack
- program counter
- both program counter and stack
- none

Check Answer

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when the thread spawns

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Wrong Answer

Register context and stack of thread are deallocated when the thread terminates.

19. Threads is not shared among which of the following?

stack
 program counter
 both program counter and stack
 none

Hide

Correct Answer

Since each thread can have its own execution sequence/code, it must have its own stack on which it might push/pop its program counter contents. So threads of same process do not share stack and program counter.

20. For which of the following is the jacketing technique used?

to construct a new thread
 to communicate between threads
 convert a blocking system call into non blocking system call
 None

Operating System MCQs

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Threads

A thread is a basic unit of CPU utilization.

It comprises

- A thread ID
- A program counter
- A register set and
- A stack

It shares with other threads belonging to the same process its code section, data section, and other operating-system resources, such as open files and signals.

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and other operating-system resources, such as open files and signals.

A traditional / heavyweight process has a **single thread of control**.

If a process has **multiple threads** of control, it can perform **more than one task at a time**.

The diagram shows a single-threaded process structure. It consists of two rows of components: 'Code', 'Data', and 'Files' in the top row, and 'Registers' and 'Stack' in the bottom row. A blue arrow labeled 'Thread' points from the bottom right towards a wavy line representing memory, indicating that the thread alternates between the stack and memory.

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The diagram shows a multi-threaded process structure. It consists of three rows of components: 'Code', 'Data', and 'Files' in the top row, three 'Registers' in the middle row, and three 'Stack' components in the bottom row. Three blue arrows, each labeled 'Thread', point from the bottom right towards the wavy lines representing memory, indicating that each thread alternates between its respective stack and memory.

TOOLS
Pencil
Diamond
T
+
/\\
Left Arrow
Right Arrow
Delete
[]
SIZE
[]

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Correct Answer

CPU scheduling is done to increase the CPU utilisation, so that many process can complete their execution without having to wait for too long.

Operating System MCQs

1. Which of the following are CPU scheduling algorithms?

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3. A process which is copied from main memory to secondary memory on the basis of requirement is known as -

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5. Which of the type of OS reads and reacts in terms of actual time?

6. A systematic procedure for moving the CPU to new process is known as-

7. UNIX is written in which

37. The most optimal CPU scheduling algorithm is _____

- Shortest Job First
- First Come First Serve
- Round robin
- None

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Wrong Answer

SJF is optimal, in that for a given set of processes and their CPU bursts/execution times it gives the least average waiting time for each process.

38. How many minimum variables is/are required to share between processes, so as to solve the critical section problem?

- one
- two
- three
- four



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17. Device driver required in?

- Register
- Main memory
- Disk
- Cache

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Correct Answer

A disk driver is a device driver that allows a specific disk drive to communicate with the remainder of the computer. A good example of this driver is a floppy disk driver.

18. When are the register context and stack of thread deallocated?

- when the thread terminates
- when the thread blocks
- when the thread unblocks
- when the thread spawns

Check Answer

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Correct Answer

Since each thread can have its own execution sequence/code, it must have its own stack on which it might push/pop its program counter contents. So threads of same process do not share stack and program counter.

20. For which of the following is the jacketing technique used?

- to construct a new thread
- to communicate between threads
- convert a blocking system call into non blocking system call
- None

Correct Answer

Jacketing technique used to convert a blocking system call into non blocking system call.

21. For which of the following is resource sharing used?

- an application having several threads of activity all within the same address space.
- share the memory and resources of the process to which the threads belong
- Compress the address space a process can use



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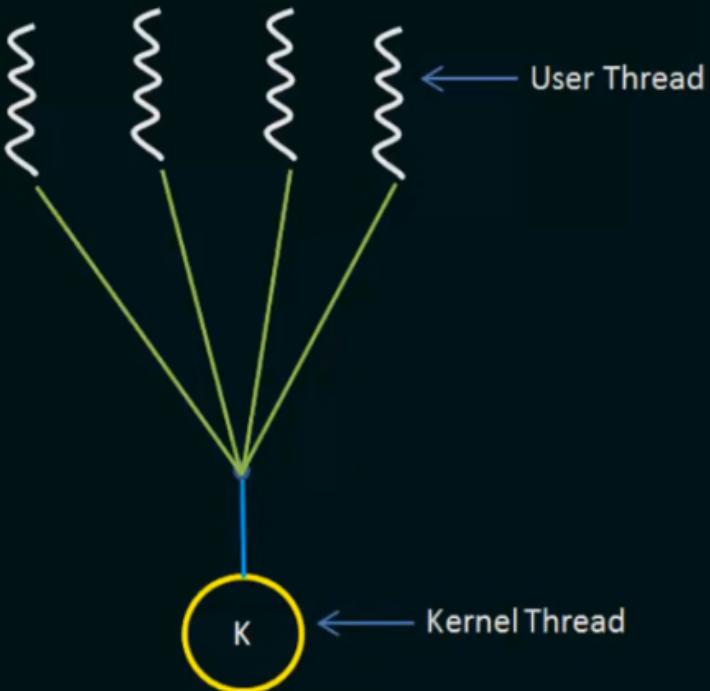


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Many-to-One Model

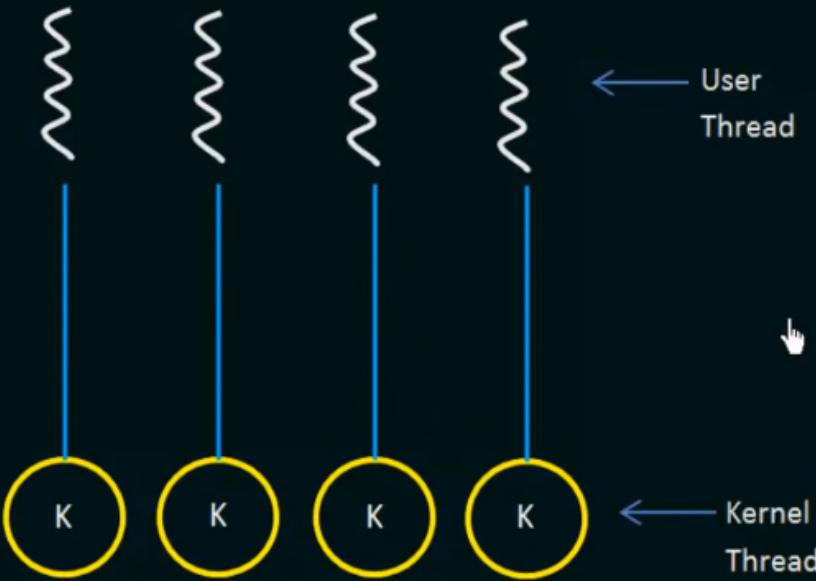


- Maps many user-level threads to one kernel thread.
- Thread management is done by the thread library in user space, so it is efficient.

one kernel thread so as I told you in
this model it Maps



One-to-One Model



- Maps each user thread to a kernel thread.
- Provides more concurrency than the many-to-one model by allowing another thread to run when a thread makes a blocking system call;
- Also allows multiple threads to run in parallel on multiprocessors.

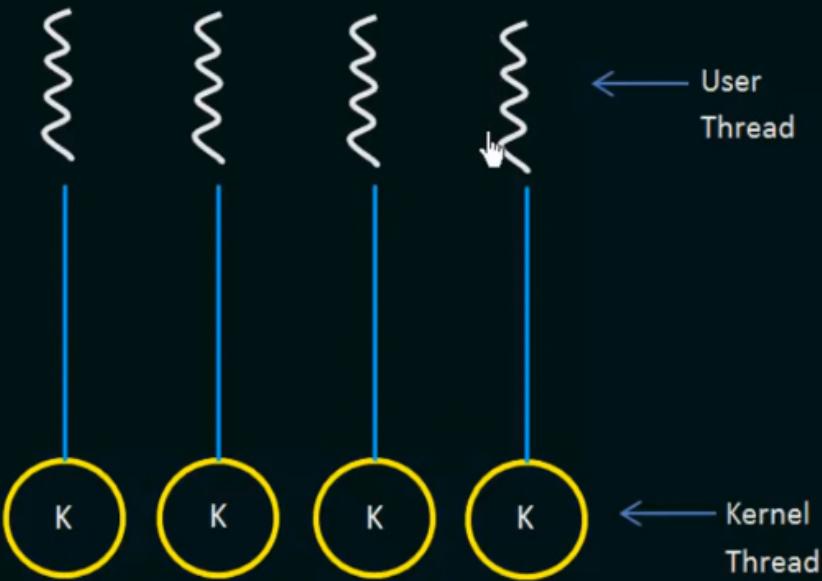
is having some advantages as compared to
the many to one model now



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One-to-One Model

- Maps each user thread to a kernel thread.
- Provides more concurrency than the many-to-one model by allowing another thread to run when a thread makes a blocking system call;
- Also allows multiple threads to run in parallel on multiprocessors.
- **Creating a user thread requires creating the corresponding kernel thread.**
- Because the overhead of creating kernel threads can burden the performance of an application, most implementations of this model restrict the number of threads supported by the system.

requires creating the corresponding kernel thread so here we

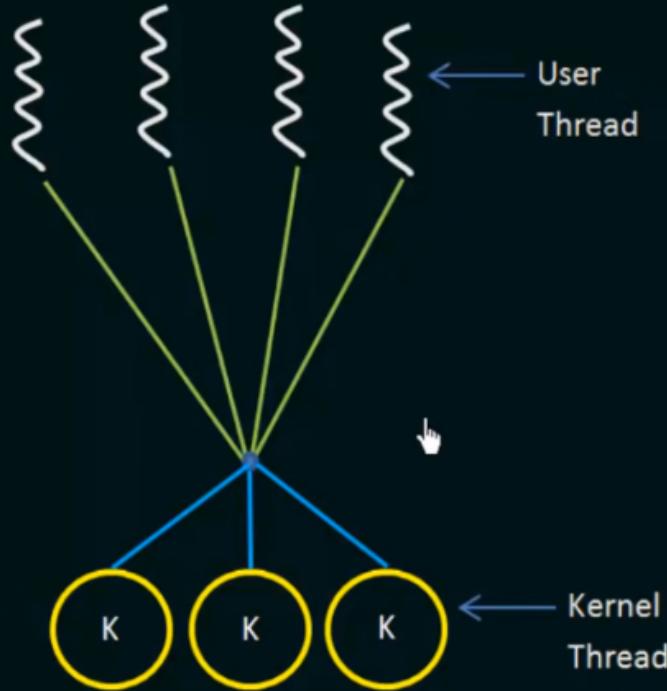
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Many-to-Many Model



- Multiplexes many user-level threads to a smaller or equal number of kernel threads.
- The number of kernel threads may be specific to either a particular application or a particular machine.
- Developers can create as many user threads as necessary, and the corresponding kernel threads can run in parallel on a multiprocessor.
- Also, when a thread performs a blocking system call, the kernel can schedule another thread for execution.

execution when one user thread performs a blocking system call so



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Hyperthreading

or

Simultaneous Multithreading (SMT)

Hyperthreaded systems allow their processor cores' resources to become multiple logical processors for performance.



It enables the processor to execute **two threads**, or sets of instructions, **at the same time**. Since hyper-threading allows two streams to be executed in parallel, it is almost like having **two separate processors working together**.

like having two separate processors
working together so this is what I



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Correct Answer

Resource sharing is used for sharing memory and resources and well as compressing the address space.

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22. Many to One model is at an advantage in which of the following conditions?

- When the program needs to be multi-threaded
- When there is a single processor present
- When the program does not need multithreading
- None

Hide

Correct Answer

Only one thread can access the Kernel at a time, so multiple threads are unable to run in parallel on multiprocessors. So, if a program does not need to be multithreading many to one model is at advantage.

23. Identify the system calls that on termination does not return control to the calling point.

- exec
- fork
- longjmp



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fork() and exec() System Calls

The fork() and exec() System Calls

fork() : The **fork()** system call is used to create a **separate, duplicate process**.

exec() : When an **exec()** system call is invoked, the program specified in the parameter to **exec()** will **replace the entire process** — including all threads.



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23. Identify the system calls that on termination does not return control to the calling point.

- exec
- fork
- longjmp
- ioctl

Hide

Correct Answer

exec is the system calls that on termination does not return control to the calling point.

24. Consider the following program:

```
main()
{
    if(fork()>0)
        sleep(100);
}
```



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A zombie process, also known as a defunct process, is a process that has finished running but still appears as an entry in the process table of the operating system. This happens when a process has completed its task but the operating system has not yet removed its entry from the process table. In other words, the process is "dead" but it still has a record of its existence.

A zombie process is not a harmful or dangerous process, and it does not consume any system resources. However, if too many zombie processes accumulate, they can use up memory and slow down the system. To prevent this from happening, the operating system automatically removes zombie processes from the process table periodically.

In summary, a zombie process is a process that has completed its task but still appears as an entry in the process table. It is not harmful to the system, but too many zombie processes can slow down the system and they are automatically removed by the operating system.

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in the "Terminated state".

I apologize for the confusion in my previous response. You are correct that a **zombie process** is a process that has completed execution but still has an entry in the process table.

In the given program, the parent process creates a **child process** using the `fork()` system call and executes the `sleep()` function for 100 seconds if the `fork()` call returns a positive value. During this time, the child process completes execution and sends an **exit signal** to the parent process using the `exit()` system call.

...

However, the parent process does not remove the child process entry from the process table using the `wait()` system call. As a result, the child process becomes a zombie process because it has completed execution but still has an entry in the process table.

Therefore, the given program creates a zombie process because the parent process does not remove the child process entry from the process table using the `wait()` system call.

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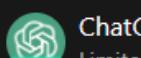
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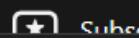


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The "getpid" system call is a call that never returns an error.

The "getpid" system call is used to retrieve the process ID (PID) of the calling process. It takes no arguments and returns the PID of the calling process as a positive integer. This system call is a simple operation that does not involve any I/O operations or file handling, so it is unlikely to encounter any errors during its execution.

In contrast, the "fork" system call, "ioctl" system call, and "open" system call may return errors under certain conditions.

...

The "fork" system call creates a new process by duplicating the calling process, and it returns a value of -1 if the fork() call fails. The "ioctl" system call is used for input/output control operations and can return errors if the requested operation is not supported by the device or file. The "open" system call is used to open a file or device and can return errors if the file or device is not found or cannot be accessed.

In summary, the "getpid" system call is a call that never returns an error, while the "fork", "ioctl", and "open" system calls may return



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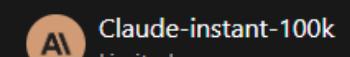


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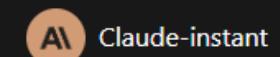
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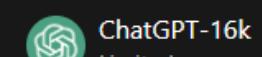
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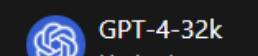


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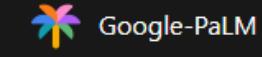
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summarise everything

Asynchronous and synchronous termination are two different ways of terminating a process or thread in an operating system.

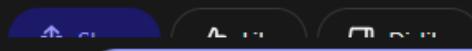
Synchronous termination allows the process or thread to complete its current task before exiting, ensuring that any critical operations or shared resources are released in a controlled manner.

Synchronous termination is often used for critical operations or shared resources.

...

Asynchronous termination terminates the process or thread immediately, without allowing it to complete its current task. Asynchronous termination is often used when the process or thread is unresponsive or has entered an infinite loop, causing the system to become unresponsive.

In summary, synchronous termination ensures a controlled release of resources, while asynchronous termination is used when immediate termination is necessary.



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7. UNIX is written in which

Correct Answer

Thread cancellation means the process terminating a thread process before its execution.

28. When a thread terminates some target thread immediately, it is known as?

- Immediate Termination
- Asynchronous termination
- Synchronous termination
- Deferred cancellation

Hide

Correct Answer

When a thread terminates some target thread immediately, it is known as Asynchronous termination.

29. Signals of some given type are

- sent together
- queued



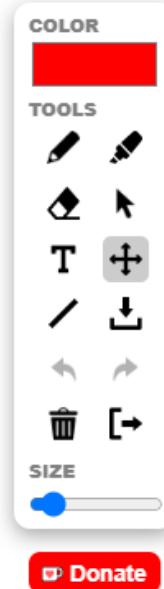
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0	SIGNAL (NULL)	Null	Check access to pid
1	SIGHUP (HUP)	Hangup	Terminate; can be trapped
2	SIGINT (INT)	Interrupt	Terminate; can be trapped
3	SIGQUIT (QUIT)	Quit	Terminate with core dump; can be trapped
9	SIGKILL (KILL)	Kill	Forced termination; cannot be trapped
15	SIGTERM (TERM)	Terminate	Terminate; can be trapped
24	SIGSTOP (STOP)	Stop	Pause the process; cannot be trapped. This is default if signal not provided to kill command.
25	SIGTSTP (STP)	Terminal	Stop/pause the process; can be trapped
26	SIGCONT (CONT)	Continue	Run a stopped process

Note the specific mapping between numbers and signals can vary between Unix implementations, please see the manual page entry `signal(5)`, by typing the following command:



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7. UNIX is written in which

kill is used to send a signal in UNIX.

31. The speed of writing data in magnetic tape disks is comparable to that of disk drives. State True/False

 True False Both, depends on the data NoneHide

Correct Answer

The statement is true. The speed of writing data in magnetic tape disks is comparable to that of disk drives.

32. What else is a command interpreter called?

 prompt kernel command shellCheck Answer

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Spooling (Simultaneous Peripheral Operations On-Line) is a technique used in computing to improve the performance of input/output (I/O) operations. Here are some key points to explain spooling:

1. Spooling is a technique that allows multiple I/O operations to be performed simultaneously, without requiring the resources to be available at the same time.
2. In spooling, data is temporarily stored in a buffer or queue before it is processed by the system.
3. Spooling is used to improve the performance of I/O operations by reducing the time that a process or user has to wait for a resource to become available.
4. Spooling is commonly used for printing, where print jobs are spooled to a print queue before they are sent to the printer. This allows multiple print jobs to be queued up and processed in the order they were received.
5. Spooling is also used for disk I/O operations, where data is temporarily stored in a buffer before it is written to or read from the disk.

6. Spooling can improve system performance by allowing



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in the order they were received.

5. Spooling is also used for disk I/O operations, where data is temporarily stored in a buffer before it is written to or read from the disk.
6. Spooling can improve system performance by allowing multiple processes or users to access shared resources without interfering with each other.
7. Spooling can also improve system reliability by buffering data in case of system failures or I/O errors.
8. Spooling may require additional resources, such as memory or disk space, to store the spooled data.
9. Spooling can be implemented in hardware or software, depending on the specific application and system requirements.

In summary, spooling is a technique used to improve the performance of I/O operations by temporarily storing data in a buffer or queue. Spooling is commonly used in printing and disk I/O operations and can improve system performance, reliability, and resource sharing.



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Operating System MCQs

1. Which of the following are CPU scheduling algorithms?

2. Operating systems

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6. A systematic procedure for moving the CPU to new process is known as-

7. UNIX is written in which

Wrong Answer

Spooling holds a single copy of data.

34. Which of the following is the only state transition that is initiated by the user process itself?

- dispatch
- wakeup
- block
- none

Hide

Wrong Answer

The only state transition that is initiated by the user process itself is block. Whenever a user process initiates an I/O request it goes into block state unless and until the I/O request is not completed.

35. Identify the two steps of a process execution.

- CPU & I/O Burst
- I/O & OS Burst
- Memory & I/O Burst
- CPU and Memory burst



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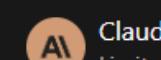


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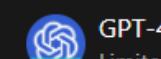


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blocked (wait) state, which occurs when a process voluntarily blocks itself while waiting for an event to occur.

summarise

The only state transition that is initiated by a user process itself is the transition from the running state to the blocked (wait) state. In an operating system, processes can be in different states, including new, ready, running, blocked (wait), and terminated. While a running process can voluntarily relinquish the CPU and transition to the ready state, the only state transition initiated by a process itself is when it blocks itself while waiting for an event to occur. The process remains blocked until the event occurs, and it is unblocked by the operating system.

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Can you explain how a process transitions from the blocked state to the running state?



What happens to a process when it is terminated?



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CPU & I/O

In computing, CPU (Central Processing Unit) and I/O (Input/Output) are two fundamental components that work together to process data and perform tasks.

The CPU is the "brain" of the computer, responsible for executing instructions and performing calculations. It performs the bulk of the processing work in a computer system, and its speed and performance are critical to the overall system performance.

I/O, on the other hand, refers to the input and output operations that a computer system performs. This includes reading data from storage devices, sending data to output devices such as printers or displays, and communicating with other devices or networks.

In a typical computer system, the CPU and I/O devices work together in a coordinated way to perform tasks. The CPU retrieves instructions and data from memory, processes the data, and sends the results back to memory or to an I/O device for output. I/O devices communicate with the CPU through input controllers (IOCs), which manage the flow of data between the CPU



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Wrong Answer

The only state transition that is initiated by the user process itself is block. Whenever a user process initiates an I/O request it goes into block state unless and until the I/O request is not completed.

35. Identify the two steps of a process execution.

CPU & I/O Burst

I/O & OS Burst

Memory & I/O Burst

CPU and Memory burst

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Wrong Answer

The two steps of a process execution are CPU and I/O burst.

36. Why is CPU scheduling done?

decrease CPU utilisation

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7. UNIX is written in which

Correct Answer

CPU scheduling is done to increase the CPU utilisation, so that many process can complete their execution without having to wait for too long.

37. The most optimal CPU scheduling algorithm is _____

- Shortest Job First
- First Come First Serve
- Round robin
- None

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Wrong Answer

SJF is optimal, in that for a given set of processes and their CPU bursts/execution times it gives the least average waiting time for each process.

38. How many minimum variables is/are required to share between processes, so as to solve the critical section problem?

- one
- two
- three



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7. UNIX is written in which

It is a program element that wants to access the collective variables and needs to be sorted out as a nuclear operation. It implies the one process has to perform its essential section in a group of communicating systems at that particular time.

39. Which of the following is known as uninterruptible unit?

- single
- static
- atomic
- none of the mentioned

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Correct Answer

Atomic is known as uninterruptible unit. That is, whenever a process starts executes, it doesn't terminate or context switch until its complete execution.

40. Semaphore is a __ and it helps to solve the problem of __?

- atomic, critical section
- integer variable, memory error
- integer variable, critical section
- atomic, memory error



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atomic, memory error

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Correct Answer

Semaphore is an integer variable and it helps to solve problems of critical sections.

41. Which of the following are two types of atomic operations performed by semaphores?

- wait, signal
- wait, stop
- signal, stop
- signal, wait

Hide

Correct Answer

Semaphore mainly helps in performing wait and signal operations.

42. The two types of semaphores are-

- Counting and decimal semaphore
- Counting and binary semaphore



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Correct Answer

A binary semaphore is initialised with value 1.

44. The release and request of resources are a type of which of the following?

system calls

I/O interrupts

command lines

None

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Correct Answer

The release and request of resources are a type system calls.

45. Is mutual exclusion required for shareable resources?

Yes

No



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In an operating system, an [unsafe state](#) occurs when a set of processes in a system requests resources in such a way that they may never be able to complete their execution.

An unsafe state can arise when processes compete for resources, and there is not enough of those resources available to satisfy all of the processes' requests. In such a situation, the processes can become deadlocked, meaning they are blocked and unable to proceed because the requested resources are held by other processes.

...

An example of an unsafe state is the [dining philosophers problem](#), where a group of philosophers sit at a round table, each holding a fork. To eat, a philosopher must have both the fork on their left and right sides. If all philosophers pick up the fork on their left side first, they will deadlock and be unable to continue eating.

An operating system can prevent an unsafe state by employing [resource allocation algorithms](#) that ensure that resources are allocated in a way that avoids deadlock. Some common [resource allocation algorithms](#) include banker's algorithm, wait-die algorithm, and wounded wait algorithm.



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Correct Answer

Mutual exclusion is not required for shareable resources.

46. Unsafe states are?

- Not deadlocks
- Deadlocks
- Livelock
- None

Hide

Wrong Answer

Unsafe states are not always deadlocks. There might be cases, where unsafe states may lead to deadlocks, but in general, it cannot be classified as deadlocks.

47. When can the binding of instructions and data to memory addresses be done?

- Load time
- Compile time



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Operating System MCQs

- Which of the following are CPU scheduling algorithms?
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- Which of the type of OS reads and reacts in terms of actual time?
- A systematic procedure for moving the CPU to new process is known as-
- UNIX is written in which

None

Wrong Answer
Unsafe states are not always deadlocks. There might be cases, where unsafe states may lead to deadlocks, but in general, it cannot be classified as deadlocks.

47. When can the binding of instructions and data to memory addresses be done?

- Load time
- Compile time
- Execution time
- All of the above

Hide

Correct Answer
Binding of instructions and data to memory addresses be done at compile time, run time as well as execution time too.

48. Which of the following is also known as the base register?

- Relocation register

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 All of the above

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Correct Answer

Binding of instructions and data to memory addresses be done at compile time, run time as well as execution time too.

48. Which of the following is also known as the base register?

- Relocation register
- Regular register
- Delocation register
- Basic register

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Wrong Answer

The Relocation register is also known as the base register.

49. Which of the following is not an operating system?

- Linux
- BSC



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Operating System MCQs

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7. UNIX is written in which

Correct Answer

Oracle is not an operating system. It is a relational data base management system, also known as Oracle Database.

50. Which of the following is a single user operating system?

- Windows
- Ms-DOS
- MAC
- None

Hide

Correct Answer

Ms-DOS is a single user operating system.

51. To access the services of operating system the interface is provided by the?

- System Calls
- API
- Library



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Operating System MCQs

1. Which of the following are CPU scheduling algorithms?

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Correct Answer

Ms-DOS is a single user operating system.

51. To access the services of operating system the interface is provided by the?

System Calls

API

Library

Assembly Instructions

Hide

Correct Answer

To access the services of operating system the interface is provided by the System Calls. Open, Close, Read, Write are some of most prominently used system calls.

52. The size of virtual memory is based on which of the following?

CPU

Address Bus

RAM



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Operating System MCQs

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Correct Answer

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52. The size of virtual memory is based on which of the following?

- CPU
- Address Bus
- RAM
- Data Bus

Hide

Correct Answer

The size of virtual memory is based on Address Bus.

53. Which of the following is an example of a real-time operating system?

- Process Control
- MS DOS



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Scheduling algorithms:

2. Operating systems

3. A process which is copied from main memory to secondary memory on the basis of requirement is known as -

4. FIFO scheduling is a type of:

5. Which of the type of OS reads and reacts in terms of actual time?

6. A systematic procedure for moving the CPU to new process is known as-

7. UNIX is written in which language?

 Hide

Correct Answer

The size of virtual memory is based on Address Bus.

53. Which of the following is an example of a real-time operating system?

- Process Control
- MS DOS
- Windows XP
- Lynx

 Hide

Wrong Answer

Process Control is not RTOS since processing time requirements (including any OS delay) are measured in tenths of seconds or shorter increments of time.



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Number	Name (short name)	Description	Used for
0	SIGNULL (NULL)	Null	Check access to pid
1	SIGHUP (HUP)	Hangup	Terminate; can be trapped
2	SIGINT (INT)	Interrupt	Terminate; can be trapped
3	SIGQUIT (QUIT)	Quit	Terminate with core dump; can be trapped
9	SIGKILL (KILL)	Kill	Forced termination; cannot be trapped
15	SIGTERM (TERM)	Terminate	Terminate; can be trapped
24	SIGSTOP (STOP)	Stop	Pause the process; cannot be trapped. This is default if signal not provided to kill command.
25	SIGTSTP (STP)	Terminal	Stop/pause the process; can be trapped
26	SIGCONT (CONT)	Continue	Run a stopped process