Quiz 1----------

-None of the above are not a component of a computer system.
-In SMP type **each processor performs all tasks within the operating system.**
-Spatial locality is the tendency of execution to involve a number of memory locations that are clustered
-Which of the following storage medium is faster in speed? **Register**
-In which mode is a system call executed? **Kernel mode**
-When an external device detects an event that requires the attention of the operating system, **it sends an interrupt to the processor**
-Which of the following is one type of user interface? **All of the above**
-Which of the following runs inside the kernel? **OS services**
-Which of the following is true regarding system calls? **It can replace the system programs as using it….**
-Which of the following is used to contain temporary data in a process's memory layout? **Stack**
-Which of the following is true about process? **Context of a process is represented in the PCB**
-Which of the following system calls is used to let the parent rpocess wait for termination of child process? **wait()**
-Which of the following system calls is used to let the parent process creates a child process? fork()
-**The buffer is empty when in==out; the buffer is full when ((in+1) % BUFFER SIZE) == out**
-Which of the following is true about threads? **Each thread has a program counter**
-A message-passing model is **easier to implement than a shared memory model for inter-computer communication**
-A microkernel is a kernel **that is compressed before laoding in order to reduce..**
-In a **zero capacity** temporary queue, the sender must always block until the recipient receives the message
-A process that has terminated, but whose parent has not yet called wait(), is known as a **zombie** process
-A **thread pool** uses an existing hread - rather than creating a new one - to complete a task.
-Is indirect communication between process P and Q **there is a mailbox to help communication between P and Q**
-In UNIX, the return value for the fork system call is **zero for the child** and a **nonzero integer for the parent process**
-F A system call is triggered by hardware
-T Many operating system merge I/O devices and files into a combined file because of the similarity of system calls for each
-**F** The single benefit of a thread pool is to contorl the number of threads
-**T** Application programmers typically use an API rather than directory invoking system calls
-T It is possible to create a thread library without any kernel-level support
-T It is possible to have concurrency without parall

Quiz 2----------

Mutual exclusion can be done on?
Hardware/software/OS à **all of them**
A semaphore is a shared integer variable
That cannot drop below zero
A deadlocked state occurs whenever
Every proc in a set is waiting for an event that can only be caused by another proc in the set
A __ type presents a set of programmer-defined operations that are provided mutual exclusion within it **Monitor**
A(n) __ refers to where a proc is accessing/ updating shared data **Critical section**
Whats the purpose of the mutex semaphore in the implementation of the bounded buffer prob
It ensures mutual exclusion
When a semaphore is used to implement mutex lock, what is its value initialized to be **1**
The following program consists of 3 concurrent procs and 3binary semaphores….how many times will P0 print **At least twice**
Which of the following cannot be scheduled by the kernel **User level thread**
When using semaphores……. What would be a possible outcome of this?
Several process could be active in the critical sections at the same time.
Which of the following condition is required for deadlock to be possible
All of the above à **mutual exclusion, proc had to be allocated, no resource ca be forcibly removed**
The circular wait condition can be prevented by **Define a linear ordering of resource types**
The proc that are residing in main mem and are ready and waiting to exe
Ready queue

Midterm 2----------

-A race condition is when **the correctness of the code depends upon the timing of the execution**
-The producer-consumer problem **is related to the allocation of resources to process states**
-Bounded waiting implies ... number of times a process is allowed to enter its critical section **after a process has made a request …**
-A system has 3 processes sharing 4 resources. If each process needs a maximum of 2 units, then deadlock **can never occur**.
-Which of the following is NOT true about segment based memory management. **Segment length must be a multiple of the page size**
-A multi-level page table is preferred in comparison to a single-level … **It helps to reduce the size of page**
-Which of the following is not true of virtual memory? **It requires the use of disk or other secondary storage**
-External fragmentation will not occur when **no matter which algorithm is used, it will always occur**.
-The purpose of a TLB is **to cache page translation information**
-Which page replacement algorithm suffers from Belady's anomaly? **FIFO**
-One of the disadvantages of the priority scheduling algorithm is that **it can lead to some low priority**…
-Which of the following is false with regards to Linux CFS scheduler? **There is a single, system-wide value or vruntime**
-Which of the following is not usually stored in a two-level page table? **Virtual page number**
-To handle deadlocks, operating system most often pretend that deadlocks **never occur**
-The monitor construct ensures that **only one process**.
-Thrashing occurs when **processes frequently access pages not in memory**
-A system uses FIFO policy for page replacement… **196**

T-The circular-wait conditions for a deadlock implies the hold and wait condition.
T-Deadlock can never occur if no process is allowed to hold a resource while requesting another resource
T-Even if a system is in an unsafe state, it is possible for the process to complete their execution without entering a deadlock state
F-In a virtual memory system, a virtual address and a physical address must be the same size.
T-Hashed page tables are particularly useful for processes with sparse address spaces.
F-Segmentation avoids external fragmentation
T-The buddy system for allocation kernel memory is very likely to cause fragmentation within the allocated segments.
F-A 32-bit logical address with 8KB page size will have 1,000,000 entries in a conventional page table.
T-A page fault must be preceded by a TLB miss
T-Stack algorithms can never exhibit Belady's anomaly
F-Protocols to prevent hold-and-wait conditions typically also prevent starvation
F-Non-preemptive scheduling algorithms are better for interactive jobs since they tend to favor...
F- In round robin scheduling, it is advantageous to give each i/o bound process a longer quantum...
F-fragmentation does not occur in a paging system.
T- A TLB miss could occur even though the requested page was …
F- A deadlock-free solution eliminates...
F - Paging may suffer from internal frag…

Midterm 1----------

-For a single-processor system **there will never be more than one running process**
-What is a trap/exception. **Software generated interrupt**
-The major difficulty in designing a layered operating system approach is **appropriately defining the various layers**
-The text segment of a process address space contains **the executable code associated with the process**
-Which of the following is not true about message passing **in direct communication multiple links may exist between a pair of processes**
-What is the READY state of a process **when process is scheduled to run after some execution**
-Which is true about processes and threads **threads in a process share the same file descriptors**
-The multithreading model supported by the linux OS is **One to One**
In a system where round robin is used for CPI scheduling, which of the following is true when a process cannot finish its computation during its current time quantum
-When a process is accessing its heap space, it exists in the **running state**
Which of the following scheduling algorithms will

Final----------

-In the process state transition diagram, the transition from the READY state to the RUNNING state indicates that A. **a process was preempted by another process**
-A critical section is **the part of a program in which shared data is accessed.**
-The Banker's Algorithm is an example of a technique for **deadlock avoidance**
-which of the following is NOT true of virtual memory, **it allows a more efficient use of memory**
-which is NOT usually stored in a two-level page table? **Virtual page number**
-The copy-on-write mechanism provides **A clever way to share virtual memory page**
-System calls **Protect kernel data structures from user code**
-Buffering is useful because **It allows devices and the CPU to operate asynchronously**
-Which of following file sys types requires fewest 4KB file block to store 16KB file **Contiguous allocation**
-A piece of code which lies dormant until triggered by some event causing system damage is called **Logic Bomb**
-True The CPU utilization is always increased as deg. Of multiprogram is increased
-False 32bit logical addr with 8bit page size will have 1,000,000 entries in a conventional page table

Which of the following scheduling algorithms must be nonpreemptive
FCFS
A cycle in a resource allocation graph is
A necessary and sufficient condition for a deadlock in the case that each resource has exactly one instance
The first reader-writers problem
Req that no reader will be kept waiting unless a writer has already obtained permission to use the shared database
A significant problem with priority scheduling algorithm is ___
Starvation
In multilevel feedback scheduling algorithm
Process can move to a different classified ready queue
TRUE/FALSE
__**F**__: protocols to prevent hold-and-wait conditions typically also prevent starvation
__F__: /a system in an unsafe state will deadlock
__T__: the monitor construct ensures that only one proc can be active RR
__T__: scheduling degenerates to FCFS if the time quantum is too long
__T__: in the Linux CFS scheduler the task with the smallest vruntime is considered to have the highest priority
Quiz 3----------
-Increasing the RAM of a computer typically improves performances because **fewer page faults occur**
-On media that uses constant linear velocity, **the density of bits per track is uniform**
With segmentation, a logical address consists of **segment number and offset**
-Which of the following data structures is appropriate for placing into its own segment? **Heap, kernel code and data, user code and data**
-Assume the value of the base and limit registers are 1200 and 350 respectively. Which of the following addresses Is legal? **1200**
-Which of the following statements are true with respect to hashed page table? **A common approach for handling addresses larger than 32 bits**
-Which of the following is a benefit of allowing a program that is only partially in memory to execute? **Programs can be written to user more memory than is available in physical memory;** CPU utilization and throughout in increased; Less I/O is needed to load or swap each user program into memory
-Suppose we have the following page access 1 2 3 4 2 3 4 1 2 1 1 3 4 and that there are three frames within our system. Using the LRU replacement algorithm, what is the number of page faults? **8**
-What size segment will be allocated for a 39KB request on a system using the Buddy system..? **64 KB**
-Which of the following is the simplest method for implementing a directory? **Linear List**
-Which on the following statements is false? **Virtual memory reduces the context switching overhead**
-DMA controllers **can steal memory access cycles from the main CPU**
-Consider a disk queue holding requests to the following cylinders in the listed order: 116, 22, 3, 11, 75, 185, 100, 87. Using the SCAN at head 88? **100 – 116- 185 – 87 – 75 – 22 -11 – 3**
-Which of the following disk head scheduling algorithms does not take into account the current position of the disk head? **FCFS**
-Which of the following is not considered a classification of user in connection with each file? **Current user**
-Contiguous allocation
-A disk with free blocks 0, 1, 5, 9, 15 would be represented with what bit map? **1100010001000001**
-Which algorithm is considered reasonable for managing a buffer cache? **Least-frequently-user LRU**
-True In general, LOOK disk head scheduling will involve less movement of the disk heads than SCAN disk head scheduling.
-False A relative path name begins at the root
-False Inverted page table require each process to have its own page table.
-False Linked allocation suffers from external fragmentation
-False Indexed allocation may require substantial overhead for its index

have the longest average response time after many jobs are queued and ran to completion
-Which of the following is true about multilevel queue scheduling? **Each queue has its own scheduling algorithm**
-Which of the following statements is false with regards to the linux cfs scheduler? **There is a single, system wide value or vruntime**

-F Non-preemptive scheduling algorithms are better for interactive jobs since they tend to favor jobs that require quick responses
-T An interrupt vector contains the addresses of the handlers for the various interrupts
-F System calls can be run in either user mode or kernel mode
-F Each thread of a process has its own virtual address space
-T All processes in UNIX first translate to a zombie process upon termination
-F In round robin scheduling it is advantageous to give each I/O bound process a longer quantum than each CUP-bound process (since this has the effect of giving the I/O bound process a higher priority)
-F Processes in a microkernel architecture operating system usually communicate using shared memory

-An interrupt is **a signal that causes the control unit to branch to a specific location**
-When a process is created using the classical fork() system call, which of the following is not inherited by the child process? **Process ID**
-A race condition is when **the correctness of the code depends upon the timing of the execution**
-The text segment of a process address space contains **the executable code associated with the process**
-Which of the following would lead you to believe that a given system is an SMP-type system? **Each processor performs all tasks within the operating system**
-Embedded computers typically run on a **real time** operating system
-A message-passing model is **easier to implement than a shared memory model for inter-computer communication**
-The major difficulty in designing a layered operating system approach is **Appropriately defining the various layers**
Which is true about processes and threads?
-Most often, application programs access system resources using **application program interfaces**
-For single-processor system **there will never be more than one running process.**
-A thread control block **does not include information about the parent process resource allocation**
-The Producer-Consumer Problem is related to **the allocation of resources to process states**
-Long term scheduling is performed **on processes in the ready queue**
-T The two primary purposes of an OS are to manage the resources of the computer and to provide a convenient interface to the hardware for programmers
-F A deadlock-free solution eliminates the possibility of starvation
-F The code that changes the system clock runs in user mode
-F A thread can be blocked on multiple condition variables simultaneously
-T It is possible to have concurrency without parallelism
-F The main difference between the use of test and set and the use of semaphores is that semaphores require the OS to do the busy waiting rather than the user program
-T Aging can alleviate the starvation problem of a low priority job
-F In a monolithic kernel, most OS components. E.g., memory management, inter-process communication, and basic synchronization modules, execute outside the kernel