1. (2299) Which of the following statements is incorrect about user mode and kernel mode?
2. In kernel mode, the OS can execute every instruction in the instruction set
3. In user mode, user program can execute only a subset of instructions
4. Having two modes of operation helps prevent user programs from accessing critical instructions

# None of the above

1. (2302) Random Access memory:
2. Is typically faster than cache memory

# Is volatile

1. Can only be read sequentially
2. Stores all the files on the computer
3. (2294) The four main structural elements of a computer system are:
4. Processor, Registers, I/O Modules, Main Memory
5. Processor, Registers, Main Memory, System Bus

# Processor, Main Memory, I/O Modules, System Bus

1. None of the above
2. (2292) What is the main characteristic of embedded operating system?
3. Multiple CPU
4. Time-sharing
5. Many I/O devices

# Restriction of memory size, speed of CPU, screen size, powers

1. (2300) Which is the difference between personal computers and mainframe computers?
2. Personal computers are always interactive
3. Mainframe computers are mostly batch systems with many users
4. Protection is much more important on mainframe computers

# All of the above

1. (2303) What is not correct about system calls?
2. A system call allows a user process to assess and execute operating system functions inside the kernel.
3. User programs use system calls to invoke operating system services

# In terms of performance, using system calls is better than using procedure calls

1. Every system call involves overhead due to context switch 7 What is correct about trap instructions and interrupts?
2. A trap instruction switch the execution mode of a CPU from the user mode to the kernel mode.
3. A trap instruction is caused by a user program to invoke functions in the OS kernel
4. An interrupt is caused by an external event

# All of the above

1. (2293) A Control/Status register that contains the address of the next instruction to be fetched is called the:
2. Instruction Register (IR)

# Program Counter (PC)

1. Program Status Word (PSW)
2. All of the above
3. (2291) The general role of an operating system is to:
4. Act as an interface between various computers

# Provide a set of services to system users

1. Manage files for application programs
2. None of the above
3. (2290) The two basic types of processor registers are:

# General and special registers

1. Control and Status registers
2. User-visible and user-invisible registers
3. None of the above
4. (2304) What is interrupt vector?
5. A signal an I/O device sends to CPU
6. A signal an I/O device sends to CPU

# Part of memory which contains the addresses of interrupt handlers

1. None of the above
2. (2297) What is not a main function of an operating system?
3. Provide the users with an extended (virtual) machine
4. Manage the I/O devices

# Provide user interfaces

1. Support virtual memory
2. (2296) Which of the following instructions should be allowed in user mode?
3. Disable all interrupts

# Read the time-of-day clock

1. Set the time-of-day clock
2. Change the memory map
3. (2298) Which of the following statements is incorrect about timesharing and multiprogramming systems?
4. In a timesharing system, multiple users can access the system simultaneously
5. In a multiprogramming system, one user can run several processes simultaneously
6. All timesharing systems are multiprogramming systems

# All multiprogramming systems are timesharing systems

1. (2295) MS-DOS is a example of ....

# Monolithic system

1. Layered System
2. Virtual Machine
3. Client-server model
4. (2309) Which of the following statements is correct about Shortest Job First
5. Avoid Starvation

# Minimize average waiting time

1. Both a and b
2. None of the above
3. (2310) In order to implement mutual exclusion on a critical resource for competing processes, only one program at a time should be allowed:

# In the critical region of the program

1. To perform message passing
2. To exhibit cooperation
3. None of the above
4. (2305) Which of the following process state transitions are legal?
5. waiting -> running

# running -> ready

1. waiting -> terminated
2. ready -> terminated
3. (2316) Which of the following is not correct about user-level threads ?
4. User-level threads are more efficient than kernel threads, in the sense that they do not need kernel calls to switch among threads
5. User-level threads cannot be preempted by clock interrupts unless the whole process' quantum has been used up

# With user-level threads, customized scheduling algorithms cannot be implemented

1. If one user-level thread makes a blocking system call, the system will block the entire process (which contains that user-level thread) 5 (2313) What is Software proposal in the solution of Mutual exclusion with Busy waiting
2. Lock Variables
3. Strict Alternation
4. Peterson's Solution

# All of the above

1. (2318) Which of the following is a preemptive scheduling algorithm
2. FCFS
3. Shortest Job First

# Round Robin

1. None of the above
2. (2308) 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:
3. Prioritization

# Round-Robin

1. LIFO
2. All of the above
3. (2307) Which of the following process state transitions are illegal?
4. Ready-> running

# waiting -> running

1. running -> ready
2. running -> terminated
3. (2312) The following requirement must be met by any facility or capability that is to provide support for mutual exclusion:
4. Only one process at a time can be allowed into a critical code section
5. A process remains in its critical region for a finite time only
6. No assumption can be made about relative process speeds

# All of the above

1. (2311) Which is the correct description of transitions between process states below? (see picture) ( Running J

( Blocked j , C Ready J

# 1: Process blocks for input; 2: Scheduler picks another process; 3: Scheduler picks this process; 4: Input becomes available

1. 1: Process blocks for input; 2: Scheduler picks this process; 3: Scheduler picks another process; 4: Input becomes available
2. 1: Process blocks for input; 2: Input becomes available; 3: Scheduler picks another process; 4: Scheduler picks this process
3. 1: Process blocks for input; 2: Input becomes available; 3: Scheduler picks this process; 4: Scheduler picks another process 11 (2306) Which of the following cannot be shared among different threads of a process?
4. Process code
5. File handles
6. Process data

# Stack

1. (2314) In a single processor system, mutual exclusion can be guaranteed by:
2. Overlapping processes
3. Interleaving processes

# Disabling interrupts

1. All of the above
2. (2315) Which is not a goal of a scheduling algorithm for batch systems ?
3. Fairness
4. Throughput
5. Turnaround time

# Response time

1. (2319) Which is a wrong statement about the quantum used in Round Robin algorithm ?
2. If the quantum is very large, RR is essentially FCFS
3. If the quantum is very small, the CPU efficiency is reduced
4. A reasonable value of quantum is around 20-50 ms

# None of the above

1. (2317) Which of the following synchronization mechanisms does not rely on busy-waiting ?
2. Lock variables
3. Strict alternation
4. Peterson's algorithm

# Semaphores

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. (2531) A page fault means that we referenced a page
2. that was outside the memory boundaries
3. with an incorrect I/O request
4. that was not in secondary storage

# that was not in main memory

1. (2534) Which of the following is appropriate to release page table and pages?
2. Process creation
3. Process execution
4. Page fault time

# Process termination time

1. (2537) Page replacement algorithms determine
2. when the system should update page table entries
3. how many pages should be added to main memory
4. which pages should be brought into memory because a process is likely to reference them soon

# which page to remove to provide space for an incoming page

1. (2530) The page table for each process maintains:

# The frame location for each page of the process

1. The page location for each frame of the process
2. The physical memory location of the process
3. None of the above
4. Which of the following information bits in the entry of page table is used to indicate Page Fault?

# Present/absent bit

1. Status bit
2. Referenced bit
3. Modified bit
4. (2528) The second-chance page-replacement algorithm

# Moves pages found at the head of a FIFO queue with the referenced bit turned on back to the tail of the queue to avoid replacing them

1. Searches through a circular list of pages and replaces the first page it encounters that has the referenced bit turned off
2. Relies on a modified bit to determine which page to replace
3. None of the above
4. (2533) Which of the following information bits used by the various page replacement policies indicates if the page has been called lately?
5. Locality bit
6. Status bit

# Referenced bit

1. Modified bit
2. (2526) When a virtual memory system manages memory in fixed length units, which of the following terms correctly represents its unit?
3. Frame

# Page

1. Sector
2. Segment
3. (2535) In terms of speed the best method of Dynamic Storage-Allocation is:
4. Next fit

# First fit

1. Best fit
2. Worst fit
3. (2538) The actual location in main memory is called a(n):
4. Relative address
5. Logical address

# Absolute address

1. None of the above
2. (2539) LRU replaces the page that has spent the
3. longest time in memory

# longest time in memory without being referenced

1. shortest time in memory
2. shortest time in memory without being referenced
3. (2536) In a system employing a paging scheme for memory management, wasted space is due to:
4. External fragmentation

# Internal fragmentation

1. Pages and frames of different specified sizes
2. None of the above
3. (2527) The task of subdividing memory between the OS and processes is performed automatically by the OS and is called
4. Protection
5. Relocation

# Memory Management

1. All of the above
2. (2532) Which of the following is appropriate to determine program size and create page table?

# Process creation

1. Process execution
2. Page fault time
3. Process termination time
4. (2525) What is the method to keep track of memory usages?
5. Memory Management with Bit Maps
6. Memory Management with Linked Lists

# a and b

1. None of the above

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 1 (2548) The special files are:

1. character special file
2. block special file
3. Neither a nor b

# Both a and b

1. (2542) Which of the following is true about the block size in disk space management
2. the larger the block size is the lower the data rate is

# the larger the block size is the worse the disk space utilization is

1. the larger the block size is lesser the disk space is
2. none of the above
3. (2540) A file is generally defined to be:
4. A basic element of data
5. A collection of related fields

# A collection of similar records

1. All of the above
2. (2546) Which of the following is not a path name for the file /etc/passwd
3. /etc/passwd
4. /etc/../etc/passwd
5. /etc/../etc/../etc/passwd

# None of the above

1. What are the allocation methods of disk blocks for files:

(2549)

1. Contiguous allocation
2. Linked allocation
3. Indexed allocation

# All of the above

1. File Structure can be:

(2547)

1. byte sequence
2. record sequence
3. tree

# All of the above

1. What is incorrect about contiguous allocation of files ? (2544)
2. It is simple to implement
3. It leads to excellent read performance

# It does not cause disk fragmentation

1. It is widely used on CD-ROMs
2. The i-nodes are used in which of the following allocation methods (2543)
3. Contiguous allocation
4. Linked allocation

# Indexed allocation

1. Linked allocation using FAT
2. (2541) Which of the following is specified to indicate the directory where the file is located?
3. Extension

# Path name

1. Root directory
2. Sub-directory
3. (2545) Which of the following is not correct about hard links and symbolic links?
4. Symbolic links need space to store the name and the file pointed to
5. Hard links do not require extra disk space
6. Symbolic links can point to files in the network

# Hard links can point to files on other machines

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. (2574) Device Driver is normally written by:

# Device's Manufacturer

1. OS's Manufacturer
2. Computer's Manufacturer
3. All of the above
4. (2578) Which of the following I/O software device layers is done by user-level software?
5. Computing the track, sector, and head for a disk read
6. Writing commands to the device registers
7. Checking to see if the user is permitted to use the device

# Converting binary integers to ASCII for printing

1. (2581) An example of the key differences that can exist across (and even in) classes of I/O devices is:
2. Data rate
3. Data representation
4. Error conditions

# All of the above

1. (2573) In general, which is the best technique for I/O Data transfer?
2. Programmed I/O
3. Interrupt-Driven I/O

# Direct Memory Access

1. None of the above
2. (2576) Which of the following statements is not correct about DMA ?
3. DMA controller has access to the system bus independent of the CPU
4. DMA helps reduce the number of interrupts (in comparison with interrupt-driven I/O)

# DMA controller is usually faster than CPU

1. The operating system can only use DMA if the hardware has a DMA controller
2. (2580) Which of the following is not correct about the reliability of different RAID levels?
3. There is no reliability support in RAID level 0

# All RAID levels can survive one disk crash

1. In RAID level 2, a single bit error in a word can be detected AND corrected
2. In RAID levels 3, 4, 5 a single bit error in a word can be detected
3. (2577) Which of the following statements is not correct about "device independence"?
4. Files and devices are accessed in the same way, independent of their physical nature
5. A system has to maintain only one set of system calls for both writing on a file and writing on the console

# Device independence requires all programmers to deal with different devices directly

1. Device independent interfaces should be given to programmers 8 (2579) What kind of I/O devices that disks and tapes belong to?
2. Stream-oriented devices

# Block-oriented devices

1. Character-oriented devices
2. None of the above
3. (2575) Which of the following statements is incorrect?
4. The term data rate refers to the speed with which data moves to and from the individual I/O device
5. In the interrupt-driven I/O technique, the processor issues an I/O request, continues with other work and eventually receives notification that the request was fulfilled

# A hard drive is an example of a character-oriented I/O device

1. None of the above
2. (2582) The I/O technique where the processor busy waits for an I/O operation to complete is called:

**a. Programmed I/O** c. Direct Memory Access (DMA) b. Interrupt-driven I/O

d. None of the above

1. The system is said to be in an unsafe state if (2590)

# The operating system cannot guarantee that all current processes can complete their work

1. The system is deadlocked
2. A process is indefinitely postponed
3. None of the above
4. (2584) If in a resource-allocation graph, each resource type has exactly one instance, which of the following indicate a deadlock situation?

# The graph has at least one cycle.

1. The graph has no cycle.
2. The graph is connected.
3. The graph is not connected.
4. All deadlocks involve conflicting needs for resources by (2583)
5. One or more processes

# Two or more processes

1. Three or more processes
2. None of the above
3. What is the characteristic of deadlocked systems (2588)
4. Starvation

# Circular wait

1. Saturation
2. Aging
3. (2586) A possibility of deadlock can occur:
4. If a system is in safe state

# If a system is in unsafe state

1. If a system is in instable state
2. None of the above
3. (2592) What is the weakness of the Banker's algorithm?
4. Allowing the population of processes to vary over time
5. Enabling processes to hold their resources indefinitely

# Requiring that processes state their maximum needs in advance

1. Enabling the number of resources to fluctuate
2. The permanent blocking of a set of processes that compete for system resources is called (2587)
3. Starvation

# Deadlock

1. Prioritization
2. All of the above
3. (2589) Which of the following is not a condition necessary for deadlock to exist?
4. mutual-exclusion condition
5. circular-wait condition
6. hold and wait condition

# preemption condition

1. (2591) Dijkstra's Banker's Algorithm require the system to maintain the resource information for each process, including:
2. A count of the system's total resources
3. The maximum resources that can be requested by the process
4. The number of resources currently acquired by the process

# B and C

1. (2585) If a deadlocked system, the processes can
2. run
3. release resources
4. be awakened

# do nothing

What is the characteristic of the first generation of operating system? [A]Personal computers, single user, multitasking

[B]Transistors, batch systems **[C]Vacuum tubes, plug boards** [D]ICs and multiprogramming

Which is not an example of a resource that is commonly time-multiplexed? [A]Graphics accelerator

**[B]Network interface** [C]Main memory [D]CPU

Which of the following is an Operating System component?

**[A]Process Management** [B]Speed Management [C]Space Management [D]Time Management

Which of the following conditions that causes the processes to be terminated, when processes have done their work?

1. Fatal error (involuntary)

# Normal exit (voluntary)

[C]Killed by another process (involuntary) [D]Error exit (voluntary)

Which of the following statements is a hardware solution to the critical region problem? [A]Semaphore

# [B]TSL|

1. None of the other choices [D]Shared memory

Which of the following process state transitions is correct, when the scheduler picks a process from the ready queue to run?

1. **Ready -> running** [B]Running -> Blocked (waiting) [C]Blocked (waiting) -> ready [D]Running -> ready

Which cannot be able to solve the race condition?

# [A]TSL

1. Shared memory [C]Semaphore [D]Monitor

Which of the following statements about semaphores is true?

[A]A semaphore implementation should guarantee that processes do not suffer indefinite postponement, [B]P and V (Down and Up) operations should be indivisible operations

# All of the other choices

1. If several processes attempt a P(S) operation simultaneously, only one process should be allowed to proceed.

Which of the following process state transitions is illegal?

**[A]Ready -> Blocked (waiting)** [B]Running -> Blocked (waiting) [C]Blocked (waiting) -> ready [D]Running -> ready

Critical Region (Section) concept used in interprocess communication is: [A]A part of shared memory

# [B]A part of the program where the shared memory is accessed

[C]None of the other choices [D]A part of shared data

Which of the following instructions should be allowed only in kernel mode? [A]AND of two numbers

[B]ADD of two numbers [C]Read the time-of-day clock **[D]Disable all interrupts**

What is an operating system structure in which the communication between requesting process and responding process is message passing? [A]Monolithic Systems

[B]All of the other choices [**C]MS-DOS**

[D]Client-Server Model

The language of the CPU is known as its [A]Register set

1. Control unit set

# IInstruction set |

1. None of the other choices

Linux and are often used as operating systems on supercomputers, mainframes, and servers. [**A]UNIX**

[B\*Windows

1. None ofthe other choices [D]Mac OS

A well-known Real-Time operating system is:

# [A]MS-DOS

[**B]e-COS**

[C]TinyOS

1. Personal Operating System

Which ofthe following operating systems is an example of monolithic system? [A]Windows XP

[B]Mac OS [C]UNIX **[D]MS-DOS**

Where is the position of the operating system in computer system:

[A]Between the user interface program and the application Program [B]None of the other choices

1. In user space

# Above the hardware and under the user interface program

The is the essential component ofthe operating system that remains in RAM when your computer is powered on. [A]registry

# kernel

1. system file

The basic idea behind the microkernel design is:

1. All ofthe other choices
2. All other modules run as relatively powerless ordinary user processes [C]Only one module runs in kernel mode

# [D]To archive high reliability by splitting operating system up into small, well-defined modules

Which is not a goal of a sheduling algorithm for all systems?

1. **Balance** [B]Response time [C]Policy enforcement [D]Fairness

Which conditions of mutual exclusion does the Lock Variables (Software proposal) violate? [A]No process must wait forever to enter its critical region

# No two processes simultaneously in critical region

1. No process running outside its critical region may block another process [D]No assumptions made about speeds or numbers of CPUs

A entry of the Process table is called:

[A]All of the other choices [B]Process check block [C]Process management block **D process control block.**

Semaphores that are initialized to 1 and used for two or more processes to ensure only one can enter its critical section at the same time are called:

[A]None of the other choices **[B]Binary semaphores** [C]Integer semaphores [D]Counter semaphores

An arrival message causes the system to create a new thread to handle this message. This new thread is call

[A]Upcall [B]Distributed[C]Activator [D]**Pop-up**

C

How many ways is Thread implemented? [A]1

[B]3

# [C]2

[D]None of the other choices

what is Software proposal in the solution of Mutual exclusion with Busy waiting? [A]Message passing

[B]Monitors **[C]Peterson's Solution** [D]All of the other choices

Which of the following is not a CPU scheduling criterion?

**[A]Burst time** [B]CPU utilization [C]Throughput [D]Response time

How many percent of the CPU time is wasted, when a computer system has enough room to hold two program and these programs are idle waiting for I/O 10% of the time?

1. 0%
2. 9%
3. None of the other choices

# [D]1 %

A computer has 2GB RAM of which the operating system occupies 1GB.

The processes are all 450 MB and have the same characteristics. How many percent is CPU utilization when these programs are idle waiting for I/O 20% of the time?

A4% B90%

# None of the other choices

1. 6%

To specify an address in this segmented memory, the form is used [A]<physical address, offset>

[B]<process, offset> [C]**<segment-number, offset>** [D]<virtual address, offset>

Where should be put the page replacement algorithm In Mach model of Page fault handling with an external pager?

# All of the other choices

1. In the low-level MMU handler
2. In the external pager running in user space
3. In the page fault handler that is part of the kernel

One of the most important innovations of demand paging was that it made feasible [A]Virtual paging

**[B]Virtual memory.** [C]Memory demand [D]Virtual demand

Which of these statements about the algorithm "Next fit" is true?

# Memory Manager searches the entire list of segments from beginning to end and take smallest hole that is adequate.

1. Memory Manager scans along the list of segments until it finds a hole that is big enough. **[C]Memory Manager starting searching the list of segments from the place where it left off last time**

[D]None of the other choices

If there are 64 pages and the page size is 2048 words, what is the length of logical address?

**[A]17 bits** [B]15 bits [C]16 bits [D]14 bits

The policy is based on the theory that the best page to remove is the one that has been in The memory the longest

[A]FIFO [B]LIFO **[C]LRU**

[D]NRU

Which of the following information bits in the entry of page table is false?

**[A]Present/absent bit** [B]Modified bit [C]Protection bit [D]Mode bit

Consider a swapping system in which the memory consists of the following hole sizes: 10 K, 4 K, 20 K, 15 K, 9 K. Assume first fit algorithm is used. Which holes are taken for successive segment requests of 8 K, 12 K, 10 K?

[A]9 K, 15 K, 10 K

# [B]10 K, 20 K, 15 K

[C]20 K, 15 K, 4 K

[D]None of the other choices

Which of the following statements is incorrect about Translation Look-aside Buffer (TLB)? [A]None of the other choices

[B]A TLB is sometimes known as an associative memory

# [C]A TLB miss implies a disk operation will follow

[D]Each entry of a TLB contains the information about one page, including the virtual page number and the corresponding page frame

Which of the following is correct about symbolic links? [A]Symbolic links can only point to files on the same machines [B]None of the other choices

1. Symbolic links need not space to store the path name

# Symbolic links can point to files in the network

Many computer users and some operating systems call subdirectories [A]Volumes

[B]Databases [C]Folders **[D]Files**

Which method is used to implement files to keep each file as a linked list of disk blocks? [A]Contiguous Allocation

[B]i-node

[C]File Allocation Table

# [D]Linked List Allocation

Which of the following allocation methods, Operating system MS-DOS is implemented?

**[A]Linked allocation using FAT** [B]Indexed allocation [C]Contiguous allocation [D]Linked allocation

Which of a system call is to allow the system announce that the file is coming and set some of the attributes?

**[A]CREATE** [B]RENAME [C]OPEN [D]CLOSE

Which of the following is not correct about hard links and symbolic links? d

1. Symbolic links need space to store the path name and considerable number of extra disk accesses
2. **Hard links can point to files on other machines** [C]Hard links do not require extra disk space [D]Symbolic links can point to files in the network

Which of a system call is to allow the file to appear in more than one directory? [A]CREATE

[**B]LINK** [C]OPEN [D]SEEK

Which of a system call is to allow the system free up internal table space? [A]SEEK

[B]OPEN

# Close

[D]DELETE

What is incorrect about contiguous allocation of files? [A]It leads to excellent read performance

# It does not cause disk fragmentation

1. It is widely used on CD-ROMs [D]It is simple to implement

Which of the following is not special file? [A]None of the other choices

[B]Block special file [C]Character special file **[D]Stream special file**

Disk can be divided up into one or more partitions. The first block of every partition is called: [A]Super block

[B]Free block [C]MBR

# [D]Boot block

Which of the following statements about interrupts and trap instructions is incorrect? [A]An interrupt is a hardware-generated change of control flow within the system **[B]None of the other choices**

[C]A trap instruction is a software-generated interrupt [D]An interrupt handler deals with the cause of the interrupt What is a "stripping" in RAID?

[A]Take away possessions from someone [B]Get undressed

[C]All of the other choices

# [D]Distributing data over multiple drives

How much cylinder skew is needed for a 5400- RPM (rotate per minute) disk with the track-to-track seek time of 1 msec? The disk has 200 sectors of 512 bytes on each track.

**[A]18 sectors** [B]12 sectors [C]24 sectors [D]36 sectors

(chú ý: 7200 - 24 & 3600-12)

In a fixed magnetic disk, each circle is called a [A]platter

[B]sector [C]block **[D]track**

Which of the following I/O software do Device drivers do? [A]None of the other choices

[B]Checking to see if the user is permitted to use the device **[C]Converting binary integers to ASCII for printing** [D]Writing commands to the device registers!

Device Driver is usually written by **[A]Device's Manufacturer** [B]OS's Manufacturer [C]Computer's Manufacturer [D]All of the other choices

The aspect of disk performance that represents the time it takes to position the head a the desired track is known as

[A]Rotational delay[B]Access time [C**]Seek time**

[D]None of the other choices

A operation concerning Stable Storage is:

1. Stable Reads
2. **All of the other choices** [C]Crash recovery [D]Stable writes

When making CDs for sale, such as music or software CDs, data is recorded on a master disc by means of a high-intensity laser beam, which burns indentations, called pits, and flat areas, called [A]Lakes

**[B]Lands** [C]Valleys [D]Hills

Rearrange the layers in I/O software starting at the bottom

1. User-level I/O software
2. Device drivers
3. Interrupt handlers
4. Hardware
5. Device-independent OS software [A]12345

[B]54321 [C]15234 **[D]43251**

When an external device becomes ready to be serviced by the processor, the device sends this signal to the processor. This signal is called:

[A]None of the other choices [B]Halt signal

# Interrupt signal

1. Handler signal

Imagine that a certain modem can read 7,000 characters per second and that the time to read a character to the modem register is so short it can be ignored. If to run this modem using interrupt- driven I/O and each character read requires an interrupt that takes 10 usee all-in to service. How many percent of the CPU does the interrupt overhead cost?

**[A]4% of the CPU** [B]7% of the CPU [C]96% of the CPU [D]93% of the CPU

Assuming that it takes 10 nsec to copy a byte, how much time does it take to completely rewrite the screen of a 1200 x 800 pixel graphics with 24- bit color?

[A]

288 msec [B]

288 micro-sec [C]

28.8 micro-sec

# [D]28.8 msec

What is asynchronous transfer in principles of I/O software?

[A]The user process makes system call and goes to sleep until other process it wakes up [B]None of the other choices

1. The user program starts system call to transfer and automatically suspended until the data are available in the buffer

# The CPU starts the transfer and goes off to do something else until the interrupt arrives

Assuming that it takes 10 nsec to copy a byte, how much time, does it take to completely rewrite the screen of a 200 character x 20 line text mode memory-mapped screen?

[A]10 micro-sec [B]30 micro-sec **c40 micro-sec** [D]20 micro-sec

Which is not a function of device drivers?

1. To manage its power requirements and log events

# To accept abstract read and write request from device independent software above it and see that they are curried out

1. To receive system call
2. To initialize the device, if needed

In a directed graph used to model deadlock, represents deadlock. [A]Dashed arrow

[B]Solid arrow [C]Any path **[D]Cycle**

All deadlocks involve conflicting needs for resources by [A]None of the other choices

**[B]Two or more processes** [C]One or more processes [D]Three or more processes

is when, in modern printing systems, a disk accepts output from several users and acts as a temporary storage area for all output until the printer is ready to accept it

1. Lagging **[B]Spooling** [C]Spoofing [D]Buffering

In a directed graph used to model deadlock, resources are represented using [A]Rectangle

[B]Circular **[C]Squares.** [D]Ellipse

What is the correct approach with the "Mutual Exclusion condition" to prevent Deadlock? [A]Take resources away

1. Request all resources initially

# Spool everything

1. Order resources numerically

Which deadlock condition does "Ordering resources numerically" attack? [A]No preemption

**[B]Circular-wait condition** (Circular wait condition) [C]Hold and wait

[D]Mutual exclusion

Which deadlock condition does "Take resources away" attack? [A]Circular-wait condition

(Circular wait condition) **BNo preemption** CHold and wait [D]Mutual exclusion

What is the weakness of the Banker's algorithm? [A]Enabling processes to hold their resources indefinitely [B]Enabling the number of resources to fluctuate

# Requiring that processes state their maximum needs in advance

1. Allowing the population of processes to vary over time Which method is used to prevent the communication deadlock? [A]All of the other choices

**[B]Timeouts** [C]Handling alarm [D]Acknowledge signal

is the act of allowing only one process to have access to a dedicated resource [A]Hold and wait condition

[B]No preemption condition [C]Circular-wait condition (Circular wait condition) **[D]Mutual-exclusion condition (Mutual exclusion condition)**

What is the correct approach of the driver of dedicated devices with requesting device that is busy to solve deadlock using Ostrich algorithm?

[A]The device driver stops the current jobs and releases the devices [B]The device driver kills those requesting processes

1. All of the other choices
2. **The device driver decides blocking and returning an error code** What is true about non-preemptable resources? (non preemptable) [A]Can be taken away from a process with no ill effects

[B]None of the other choices

# [C]Will cause the process to fail if taken away

[D]Can share among processes

A is a group of related records that contains information to be used by specific application programs to generate reports. [A]Field

**[B]File** [C]Record group [D]Directory

If a system is deadlocked, no processes can [A]release resources

[B]be awakened [C]run

# [D]All of the other choices

Consider a swapping system in which the memory consists of the following hole sizes: 10K, 4K, 20K, 15K, 9K. Assume best fit algorithm is used. Which holes are taken for successive segment requests of 8K, 12K, 10K? [A]10K, 15K, 20K

[B]10K, 20K, 15K **[C]9K, 15K, 10K** [D]20K, 15K, 10K

is a specialized WRITE command for existing data files that allows for appending records or for rewriting selected records in their original place in the file. **[A]MODIFY**

[B]UPDATE [C]APPEND [D]REWRITE

A is a portion of a process that can run independently. [A]subprocess

**[B]thread** [C]program [D]Mini-process

Which of a system call is to allow the system fetch the attributes and list of disk addresses into main memory for rapid access on later call? [A]SEEK

[B]OPEN **[C]RENAME** [D]CLOSE

Which of the following statements is incorrect about I/O using DMA? [A]DMA helps free up the CPU during the I/O to do other work [B]None of the other choices

# [C]DMA is software solution to speed up data transfer between I/O device and memory

[D]DMA helps reduce the number of interrupts

Which of the following actions generates an external interrupt?

[A]A page that does not exist in the main memory is accessed by the virtual storage management.

**[B]An input/output operation is completed**. [C]Division by zero occurs.

[D]A system call instruction is executed.

Which of the following statements about Electrically Erasable PROM (EEPROM) is correct? [A]Volatile

[B]Can be erased and rewritten [C]Unprogrammable

# [D]None of the other choices

The term a specialized instruction set.

[A]None of the other choices[B]I/O device**[C]DMAcharacterizes a system configuration that includes an I/O module that is a separate processor with**

[D]Programmed I/O

Which of the following allocation methods the i-nodes use? [A]Linked allocation using FAT

**[B]Indexed allocation** [C]Linked allocation [D]Contiguous allocation

When there is an excessive amount of page swapping between main memory and secondary storage, the operation becomes inefficient, which is called .

**[A]thrashing** [B]Over swapping [C]hot swapping

[D]excessive demand paging

Suppose a virtual address space of 2^28 words and the page size is 2^12 words. If the virtual address is 1234567 in Hexadecimal , what would be the page number in Hexadecimal? [A]12345

[B]123456 **[C]1234** D 123

Which of the events that causes the processes to be created, when an operation system is booted? [A]|Execution of a process creation system cal

1. Initiation of a batch job
2. User request to create a new process

# System initialization

Deadlock definition:

A set of processes is deadlocked if each process in the set is waiting for an event that only another process in the set can cause. What does event mean?

# The event is release of a currently held resource

1. The event is some mouse click
2. The event is press some key on keyboard [D]None of the other choices

An interrupt that leaves the machine in well-defined state is called a(n)

1. **Precise interrupt** [B]Disappointed interrupt [C]Required interrupt [D]Imprecise interrupt

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The absolute pathname of a file in Linux is with respect to the [A]Home directory

1. Root directory on the system **[C]All of the other choices** [D]Login directory

A

Which of the following statement is correct about a disadvantage of memory-mapped I/O?

# Caching a device control register would be disastrous

1. Programs can use 1 instructions to test whether the device is ready

[C]Since the control registers of devices are mapped into the memory space, device drivers can be written in C [D]No special protection mechanism needed to keep user processes from performing I/O

As one proceeds down the memory hierarchy (from inboard memory to offline storage), the following conditions apply:

[A]Increasing capacity[B]Decreasing cost per bit**[C]All of the other choices**

[D]Increasing access time

Which classes of I/O devices that Clock belong to? [A]Stream devices

[B]Block devices [C]Character devices

# [D]None of the other choices

Operating system abstraction supports the ability to have operation even when there is only one CPU available

[A]None of the other choices [B]parallel

[C]multiple [D]**pseudoparallelism**

Excessive external fragmentation Which is special file? [A]None of the other choices

[B]block special file [C]character special file

# [D]Both character special file and block special file

In the memory-mapped I/O system, in order that CPU communicates with the control registers in the devices, the control register is assigned : [A]Index

[B]Unique memory address [C]I/O address

# [D]None of the other choices (I/O post number)

Which of special register contains the condition code bits, the CPU priority, the mode bit and other control bits?

# [A]

**Program Status Word (PSW)**

[B]

None of the other choices [C]

Instruction Register (IR) [D]

Program Counter (PC)

is when each process involved in the impasse is waiting for another to voluntarily release the resource so that at least one wil l be able to continue on. [A]Hold and wait condition

[B]No preemption condition [C]Mutual-exclusion condition **[D]Circular-wait condition**

1. Mutual exclusion condition. Each resource is either currently assigned to exactly one process or is available.
2. Hold and wait condition. Processes currently holding resources that were granted earlier can request new resources.
3. No preemption condition. Resources previously granted cannot be forcibly taken away from a process. They must be explicitly released by the process holding them.
4. Circular wait condition. There must be a circular chain of two or more processes, each of which is waiting for a resource held by the next member of the chain. Which of these statements about the algorithm "Worst fit" is true?

[A]Memory Manager starting searching the list of segments from the place where it left off last time. [B]Memory Manager scans along the list of segments until it finds a hole that is big enough.

1. Memory Manager searches the entire list of segments from beginning to end and take smallest hole that is adequate.

# None of the other choices (largest hole)

first fit : first hole

next fit: last time best fit: smallest hole worst fit: largest hole

allows a resource to be held by a process as long as it is needed. [A]No preemption condition

**[B]Hold and wait condition** [C]Circular-wait condition [D]Mutual-exclusion condition

Which of the following is not a step in the boot process? **[A]The antivirus program checks all files for viruses.** [B]Configuration and customization settings are checked [C]The operating system is loaded into RAM.

[D]The BIOS is activated by powering on the CPU.

Which of a system call is to allow the system free up disk space? [A]OPEN

[B]CLOSE [C]SEEK **[D]DELETE**

Which of the following conditions that causes the processes to be terminated, when the processes executes a system call tell the OS to finish some other process? [A]Fatal error (involuntary)

1. Error exit (voluntary)

# Normal exit (voluntary)

**[D]Killed by another process (involuntary)**

Assume the Memory Manager receives a request for a block of 200. When the best-fit algorithm is used, is the beginning address of the hole granted by the Memory Manager. Beginning Address of Hole Size

4075 105

5225 5

6785 600

7560 20

7600 205

10250 4050 [A]6785 **[B]7600** [C]10250

An example of preemptable resources is [A]DVD device

# Memory

1. None of the other choices [D]CD-ROM device

What is true about preemptable resources? [A]Can share among processes

[B]Can be taken away from a process with no ill effects [C]None of the other choices

# [D]Will cause the process to fail if taken away

Which of the following is a method to keep track of memory usages? [A]

Memory Management with Linked Lists [B]

Memory Management with Bit Maps

# [C]

**Both Memory Management with Bit Maps and Memory Management with Linked Lists**

[D]

None of the other choices

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# Assume the following events and actions take place. The following statement is true. Event Action

1 P1 requests and is allocated R1. P1 requests and is allocated R1 2 P2 requests and is allocated R2

3 P3 requests and is allocated R3 4 P1 requests R2.

5 P2 requests R3. 6 P3 requests R1.

**[A]There is no deadlock** [B]Event 5 caused deadlock. [C]Event 4 caused deadlock [D]Event 6 caused deadlock.

The page size that is too small wil l generate [A]More difficult to calculate actual position [B]Excessive internal fragmentation

# [C]Very long Page tables

[D]Excessive external fragmentation

Which of the following statements is not correct about the device controller of I/O devices? [A]Is also called adapter

[B]Can handle two, four, or even eight identical devices [C]Is electronic component of device

# [D]Is software component of device

Circular-wait condition

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There are entries per page in the Page table. [A]1

[B]3

# [C]2

[D]4

In terms of disk storage efficiency, the method of "Backing up pages dynamically" in comparison with the method of "Paging to a static swap area" is

1. Worse **[B]Better** [C]Nearly equal [D]Equal

Each entry of a TLB contains the information about one page, including the virtual page number and the corresponding page frame

In a system employing a paging scheme for memory management , wasted space is due to: [A]None of the other choices

# Internal fragmentation

1. Pages and frames of different specified sizes [D]External fragmentation

D

Which of the events that causes the processes to be created, when an operation system is booted? [A]|

Execution of a process creation system call

[B]

Initiation of a batch job [C]

User request to create a new process [D]

**System initialization**

Which of following statements about the memory hierarchy is false? [A]Small amount of fast expensive memory - cache

[B]Gigabytes of slow cheap disk storage

# None of the other choices

1. Some medium-speed medium price main memory Which is the fastest bus in the IBM PC computer? **[A]**

# ISA (Industry Standard Architecture)

[B]USB (Universal Serial BUS) [C]IDE (Integrated Drive Electronic)

[D]PCI (Peripheral Component Interconnect)

The page size that is too small will generate [A]

More difficult to calculate actual position [B]

Excessive internal fragmentation [C]

**Very long Page tables**

Excessive external fragmentation

In a directed graph used to model deadlock, processes are represented using [A]Rectangle

**[B]Circular** [C]Squares [D]Ellipse

B

How many categories can be the I/O devices roughly divided? [A]3

**[B]2**(block devices and character devices) [C]4

[D]1

What is not the technique of implementation for Virtual Memory? [A]All of the other choices

[B]Paging [C]Segmentation **[D]Partition**

DMA operations require the following information from the processor [A]Starting memory location to read from and write to

1. **All of the other choices**
2. Address of I/O device
3. Number of words to be read or written
4. Mutual exclusion condition. Each resource is either currently assigned to exactly one process or is available.
5. Hold and wait condition. Processes currently holding resources that were granted earlier can request new resources.
6. No preemption condition. Resources previously granted cannot be forcibly taken away from a process. They must be explicitly released by the process holding them.
7. Circular wait condition. There must be a circular chain of two or more processes, each of which is waiting for a resource held by the next member of the chain.

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[C]Memory Manager searches the entire list of segments from beginning to end and take smallest hole that is adequate.

[**D]None of the other choices (largest hole)**

first fit : first hole next fit: last time best fit: smallest hole worst fit: largest hole

Which of the following file structure is used for file system in Window?

1. **Tree**
2. Record sequence [C]Byte sequence [D]Ring

A CPU may have separate fetch, decode and execute units, so that can carry out three steps of the three instructions in the same time is called:

[A]

Multicore

**[B]**

**Pipeline**

1. None of the other choices [D]Superscalar