

# Operating System MC Exercises 2010-2011

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### (2010-1-01)

```
int ii = 0xdead;  
int jj = 0xface;  
ii + jj =
```

- i. 0x1d97b
- ii. 0x11101100101111011
- iii. 0xdeadface

A) i            B) ii            C) iii            D) i, ii, and iii            E) none

### (2010-1-02)

Creating a new *thread* is:

- i. much faster than creating a new process.
- ii. much slower than creating a new process.
- iii. as fast as creating a new process.

A) i            B) ii            C) iii            D) i, ii, and iii            E) none

### (2010-1-03)

A Round Robin scheduling system:

- i. with a large time quantum/slice is less responsive.
- ii. with a large time quantum/slice is more responsive.
- iii. can not be a non-preemptive system.

A) i and ii            B) i and iii            C) ii, and iii            D) i, ii, and iii            E) none

### (2010-1-04)

A spin-lock semaphore:

- i. wastes CPU cycles
- ii. is also called a busy-waiting semaphore
- iii. is less accurate compared to the block/wakeup method.

A) i and ii            B) i and iii            C) ii and iii            D) i, ii, and iii            E) none

### (2010-1-05)

Deadlock Strategy:

- i. Most General Purpose Operating Systems provide "Deadlock Prevention" mechanism.
- ii. Most General Purpose Operating Systems provide "Deadlock Avoidance" mechanism.
- iii. Most General Purpose Operating Systems provide "Nothing" to avoid Deadlock.

A) i            B) ii            C) iii            D) i, ii, and iii            E) none

**(2010-1-06)**

The page fault frequency can be reduced if:

- i. most processes are CPU bound
- ii. enlarging the page size
- iii. most processes are I/O bound

A) i                      B) ii                      C) iii                      D) i, ii, and iii                      E) none

**(2010-1-07)**

The host uses Interrupts to handle:

- i. busy-waiting/polling events
- ii. asynchronous events
- iii. both maskable and non-maskable events.

A) i and ii                      B) i and iii                      C) ii and iii                      D) i, ii, and iii                      E) none

**(2010-1-08)**

An Operating System is:

- i. a program
- ii. an intermediary between the users and the hardware of a computer
- iii. a license

A) i and ii                      B) i and iii                      C) ii, and iii                      D) i, ii, and iii                      E) none

**(2010-1-09)**

A System Programs is:

- i. part of the kernel
- ii. also called Applications Programs
- iii. also called System Calls

A) i                      B) ii                      C) iii                      D) i, ii, and iii                      E) none

**(2010-1-10)**

The VMware family (eg. "**VMware Player**"):

- i. is a MINIX tool.
- ii. runs as an application on top of a host operating system
- iii. does not require virtualization support from the host kernel

A) i and ii                      B) i and iii                      C) ii and iii                      D) i, ii, and iii                      E) none

**(2010-1-11)**

For the **fork()** system call:

- i. the return code for the fork() of child process is 0.
- ii. the return code for the fork() of parent process is 0.
- iii. the process ID of the child process is 0.

A) i                      B) ii                      C) iii                      D) i, ii, and iii                      E) none

**(2010-1-12)**

A Real Time System may have these following characteristic:

- i. general/multipurpose
- ii. large size
- iii. real number only, no integer

A) i and ii      B) i and iii      C) ii and iii      D) i, ii, and iii      E) none

**(2010-1-13)**

A Multimedia System may have these following characteristic:

- i. large files
- ii. sensitive to timing delay
- iii. high data rates

A) i and ii      B) i and iii      C) ii and iii      D) i, ii, and iii      E) none

**(2010-1-14)**

A Direct Memory Access (DMA) controller:

- i. increases I/O interrupts.
- ii. reduces I/O interrupts.
- iii. has nothing to do with I/O interrupts.

A) i      B) ii      C) iii      D) i, ii, and iii      E) none

**(2010-1-15)**

In a Memory Mapped I/O system:

- i. The I/O instructions are special
- ii. A certain memory address range is reserved for the I/O interfaces.
- iii. The I/O uses the same instructions as the Memory References.

A) i and ii      B) i and iii      C) ii, and iii      D) i, ii, and iii      E) none

**(2010-1-16)**

There size of a disk with 5 double side platters, 5000 cylinders, 1024 sectors per track, and 1 kBytes per sector is:

- i. More than 60 Gbytes
- ii. More than 40 Gbytes
- iii. More than 20 Gbytes

A) i and ii      B) i and iii      C) ii and iii      D) i, ii, and iii      E) none

**(2010-1-17)**

An address generated by the CPU is commonly referred to as:

- i. a register address
- ii. a logical address
- iii. a physical address

A) i                  B) ii                  C) iii                  D) i, ii, and iii                  E) none

**(2010-1-18)**

The Translation Look-aside Buffer (TLB):

- i. is a software strategy of a page-table implementation
- ii. is a small fast look-up cache
- iii. should have the entry size as large as the page-table size

A) i                  B) ii                  C) iii                  D) i, ii, and iii                  E) none

**(2010-1-19)**

A strategy to load pages only as there are needed is known as:

- i. shared paging
- ii. swap paging
- iii. demand paging

A) i                  B) ii                  C) iii                  D) i, ii, and iii                  E) none

**(2010-1-20)**

The SSTF (Shortest Seek Time First) disk scheduling algorithm,

- i. may cause starvation for some request
- ii. is the most optimal scheduling algorithm
- iii. selects the request with the least seek time from the current head position.

A) i and ii                  B) i and iii                  C) ii and iii                  D) i, ii, and iii                  E) none

**(2010-1-21)**

When the disk arm moves from end to end, servicing all requests in its path, the scheduling mechanism is known as:

- i. Shortest Seek Time First (SSTF)
- ii. SCAN
- iii. LOOK

A) i                  B) ii                  C) iii                  D) i, ii, and iii                  E) none

### (2010-1-22)

The memory page fault frequency can be reduced if:

- i. most processes are CPU bound
- ii. enlarging the page size
- iii. most processes are I/O bound

A) i                      B) ii                      C) iii                      D) i, ii, and iii                      E) none

### (2011-1-01)

Which of these following statements are true?

- i. The operating system kernel consists of all system program and all application programs in a computer.
- ii. A micro-kernel is a kernel that is compressed before loading in order to reduce its resident memory size
- iii. System calls can be executed in either user mode or kernel mode.

A) i and ii   B) i and iii   C) ii and iii   D) i, ii, and iii   E) none

### (2011-1-02)

In a shared-memory system,

- i. the responsibility for providing communication rests with the operating system.
- ii. the operating system needs to provide the shared memory.
- iii. shared memory allows maximum speed and convenience of communication

A) i and ii   B) i and iii   C) ii and iii   D) i, ii, and iii   E) none

### (2011-1-03)

Which of these following statements are true?

- i. Command interpreter allows users to directly enter commands to be performed by the operating system.
- ii. System calls allows a running program to make requests from the operating system directly.
- iii. System programs are provides to satisfy many common user requests. Some of them are simply user interfaces to system calls.

A) i and ii   B) i and iii   C) ii and iii   D) i, ii, and iii   E) none

### (2011-1-04)

Which of these following statements are true?

- i. In multiple core environment, an Operating System can transform a single-threaded process to become a multiple-threaded process.
- ii. A dual core processor can execute maximum only two threads in the same time.
- iii. Threads do not share its registers and stack.

A) i and ii   B) i and iii   C) ii and iii   D) i, ii, and iii   E) none

### (2011-1-05)

Which of these following statements are true?

- i. The scheduling of user threads is decided by Operating Systems.
- ii. Some scheduling algorithms may lead some processes to face starvation where processes have to wait and get served again within a specified time.
- iii. Today many Operating Systems use burst-based scheduling algorithm that can determine exactly the burst time of incoming processes.

A) i and ii   B) i and iii   C) ii and iii   D) i, ii, and iii   E) none

### (2011-1-06)

Which of these following statements are true?

- i. A cooperating process is one that can affect other processes executing in the system.

- ii. A cooperating process is one that can be affected by other processes executing in the system.
- iii. Cooperating processes can either directly or indirectly share a logical address space.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-1-07)

Which of these following statements are true?

- i. It is possible to have a deadlock involving only a single process with multiple threads.
- ii. It is impossible to have a deadlock involving only a single process with a single thread.
- iii. It is possible to have a deadlock involving only a single resource with a single instance.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-1-08)

Which of these following statements are true?

- i. **A system with fixed sized memory allocation units may suffer from external fragmentation.**
- ii. Neither “first fit” nor “best fit” strategies for memory allocation suffer from external fragmentation.
- iii. External fragmentation occurs because the memory allocated to a process is larger than the requested memory.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-1-09)

- i. Most memory management algorithm require hardware support.
- ii. **An address generated by the CPU is commonly referred to as a physical address.**
- iii. A memory-management Unit (MMU) is a hardware device that maps virtual addresses to physical addresses.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-1-10)

- i. Virtual Memory is a technique that allows the execution of processes that are not completely in memory.
- ii. Virtual Memory allows processes to share files easily.
- iii. **Virtual Memory can decrease CPU utilization and throughput.**

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-1-11)

- i. **Modern computer systems uses disks as the primary on-line storage medium.**
- ii. A File System resides permanently on secondary storage.
- iii. A Virtual File System separates the File System generic operations from their implementation.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-1-12)

- i. A file is an abstract data type defined and implemented by user.
- ii. **A file has a certain defined structure, which depends on its type.**
- iii. **A file is a sequence of logical records.**

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none



### (2011-1-13)

- i. Data transfer rate of reading/writing the magnetic disk is always slower compared to transfer rate of delivering the data to/from the operating system.
  - ii. A disk can be sliced into multiple partitions, or a volume can span multiple partitions on multiple disks.
  - iii. Each partition can be either containing no file system, or containing a file system.
- A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-1-14)

- i. A buffer is a memory area that stores data being transferred between a device and an application.
- ii. A cache is a region of fast memory that holds copies of data.
- iii. A spool is a buffer that holds output for a device.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-01)

- i. An Operating System is a software that manages the computer hardware.
- ii. An Operating System is both software and hardware that manages software applications.
- iii. An Operating System provides an environment for software applications to run.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-02)

- i. The Microsoft Public License is a free software license.
- ii. The GNU General Public License (GPL) is a free software license
- iii. The Creative Commons Attribution 2.0 license (a.k.a. CC BY) is free license that is good for art and entertainment works.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-03)

- i. Nowadays, Operating Systems are usually written in a low level language like assembler.
- ii. The IBM OS/360 was written in C language.
- iii. In the past, Operating Systems were usually written in Fortran IV.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-04)

- i. A program is a process in execution.
- ii. There are two major classes of queues in an Operating System: I/O Request queue and the Ready Queue
- iii. Each process is represented on the Operating System by its own PCB (Process Control Block).

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-05)

- i. User-level threads are threads that are visible to the programmer.
- ii. User-level threads are unknown to the kernel.
- iii. User-level threads, in general, are slower to create.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-06)

- i. The FCFS (First Come First Served) scheduling algorithm is non-preemptive.

- ii. The RR (Round Robin) scheduling algorithm is non-preemptive.
- iii. The SJF (Shortest Job First) scheduling algorithm can be both non-preemptive or preemptive.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-07)

- i. A Race Condition is where the outcome of executions depends on the order of accessing/modifying the shared data.
- ii. A Critical Section is a segment of code where the process crashes.
- iii. The Peterson's solution requires the processes to share two data items: a "turn" integer and two boolean "flags".

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-08)

- i. After a UNIX fork operation, the parent and new child process are identical in all respects.
- ii. In the operating system environments with no virtual memory, the operating system has to worry about deadlock occurring involving physical memory as a resource.
- iii. A micro-kernel-style operating system uses multiple address spaces inside the operating system – with components such as the file system, network stack, and device drivers all running at user level.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-09)

- i. The interrupt controller can only be modified in user mode.
- ii. Kernel memory is not available to users in user mode.
- iii. Modifications to the page tables are only possible in kernel mode.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-10)

- i. Processes on the same processor can communicate with one another by "Memory Sharing".
- ii. Processes on the same processor can communicate with one another by "Message passing".
- iii. Processes on the same processor can communicate with one another by "File System Sharing".

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-11)

- i. An i-node is a file system.
- ii. The smallest addressable piece of data on a disk drive is sector.
- iii. A File is a persistent, named collection of data.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-12)

Consider a demand paging system, where a dedicated disk is used for paging, and file system activity uses other disks. The measured utilizations of the various system components, in terms of time, not space, are as follows: [CPU utilization: 20%; Paging (dedicated) disk: 99.7%; Other I/O devices: 5%]

- i. Get a larger capacity paging disk will have CPU utilization effect.
- ii. Increase the degree of multiprogramming will make the problem worse, i.e. decreases the CPU utilization.
- iii. Providing more physical memory will reduce the amount of paging, i.e. increases the CPU utilization.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-13)

A file system with a write-behind (delay) policy:

- i. Delaying writes allows multiple small writes to be batched together into a larger, more efficient large write (also improves allocation).
- ii. Temporary files that are created, read, then deleted may never be written to disk
- iii. A crash will only cause a delay with no lost of data.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-14)

- i. "Hyper-threading" is a term used to describe systems with thousands of threads.
- ii. The rate of page faults in a virtual memory system can always be reduced by adding more memory.
- iii. Doubling the block size in the Linux ext2 file system will exactly double the maximum file size.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-15)

- i. Protection is an external problem.
- ii. Security is an internal only problem.
- iii. Multi-factor authentication increases the chance of authentication forgery.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-16)

- i. Port scanning typically is automated using a software tool.
- ii. Denial of Service (DOS) attacks are aimed for collecting information.
- iii. Distributed DOS are more difficult to prevent than DOS.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-17)

- i. A computer system is a collection of processes and objects.
- ii. A process is a program in execution.
- iii. There are both hardware objects (e.g. CPU, memory, etc.) and software objects (files, programs, etc.).

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-18)

- i. For disks with constant areal bit density (bits stored/unit area of disk media), the disk head reads bits at a different rate on the outer tracks than on the inner tracks.
- ii. In a modern operating system using memory protection through virtual memory, the hardware registers of a memory-mapped I/O device can only be accessed by the kernel.
- iii. With the NFS distributed file system, it is possible for one client to write a value into a file that is not seen by another client when reading that file.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-19)

- i. Most Modern Operating Systems support multi page size.
- ii. Increasing the size of a page will increase the size of the page table.
- iii. A database application can take performance advantage with a very large page size.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-20)

- i. The VFS layer handles journaling for Very Large File Systems.
- ii. Several implementation for the VFS may coexist on the same machine.
- iii. The VFS distinguish local files from remote ones.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none

### (2011-2-21)

- i. Host-attached Storage (HAS) is a storage accessed through local I/O ports.

- ii. A Network-attached Storage (NAS) device is a special purpose storage system that is accessed remotely over a data network.
- iii. A Storage-area Network (SAN) is a private network connecting servers and storage units.

A) i and ii B) i and iii C) ii and iii D) i, ii, and iii E) none