CSC 227: Operating Systems   Midterm Exam 1   Spring 2012/2013
Date: March 9, 2013   Time: 7:00 pm– 9:00 pm

Student Name: …………………………………….   **ID#: ………………**   **Section#: ……………**
This examination is close notes and close book.

QUESTION 2 [8.0 marks]

1. [1.5 mark] Explain why an operating system can be viewed as a control program.
   Answer: Controls execution of programs to prevent errors and improper use of the computer

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2. [1.0 mark] What are the main components of computer system?

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3. [1.0 mark] Discuss the purpose of the device driver.
   Answer: It allows computer programs to interact with a hardware device

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4. [1.5 marks] List THREE advantages of using multiprocessing.
   Answer:
   1. Increased throughput
   2. Economy of scale
   3. Increased reliability – graceful degradation or fault tolerance

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5. [1.5 mark] What is the name given to each of the following?

   a. A place in CPU that is used to store an instruction that is fetched from memory to be executed.
      Answer: Instruction register
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   b. Special type of operating systems that provide direct communication between the users and the system within an acceptable response time.
      Answer: Timesharing (Multitasking)
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6. [1.5 mark] Explain why operating system design for a single user computer is different from its design of mainframe?
   Answer: For single user computer, the main target is to improve user friendliness rather than system resources. For mainframe computers, the main target is to improve system resources

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QUESTION 3 [7.0 marks]

1. [1.0 mark] What are the major differences between MS-DOS and Unix operating system?
   Answer:
   General question
   MS-Dos: Single tasking - Not divided into modules - Although MS-DOS has some structure, its interfaces and levels of functionality are not well separated
   Unix: Multi-tasking - Divided into modules or layers.

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2. [1.0 mark] Why the operating system is more safe and more secure in the microkernel approach?
   Answer:
   Because most of the operations are done in user mode than in kernel mode.

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3. [1.0 mark] List FOUR major categories of system call.
   Answer:
   a) Process control
   b) File management
   c) Device management

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d) Information maintenance
e) Communications
f) Protection

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4. [1.0 mark] What is the advantage of separating mechanism and policy in OS design?

   Answer: The separation of policy from mechanism is a very important principle, it allows maximum flexibility if policy decisions are to be changed later

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5. [1.5 mark] What is the name given to each of the following?
   a. A specific design depending on removing all nonessential components from kernel, moves as much from kernel into the user space.
      Answer: Microkernel

6. [1.5 marks] What are the advantages of programming using an API rather than invoking actual system calls?

   Answer:

   Direct system calls can often be more detailed and difficult to work. Also, a program that uses an Application Program Interface (API) can be compiled and run on any machine that supports the same API