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Spring Semester 2016-2017

Student's Name:............ مهندس / محمد منور داد CSC227 | Midterm 1 Exam | 27-03-2017

...Student's ID.......................

Question 1. [8 Marks] Select ONLY ONE ANSWER (the best answer).
Copy your answer for questions 1-1 to 1-16 to the table on page2. <u>ONLY THAT TABLE WILL BE GRADED.</u>

1.	Which of the following is/are the functions of operating system?
A.	Sharing hardware among users as resources' allocator.
B.	Preventing users from interfering with one another as processors' controller, and Recovering from errors.
C.	A and B
D.	A and B except "Recovering from errors".

2.	During the boot process, a computer obtains its initial bootstrapping information from:
A.	A special "boot block" on disk called firmware.
B.	the superblock in the root file system
C. ✓	a pre-configured file within the kernel ✓
D.	None of the above

3.	I/O devices and the CPU can execute concurrently. Device controller informs CPU that it has finished its operation by causing:
A.	an update to its local buffer
(B.)	An interrupt ✓
C.	Call to device controller
D.	None of the above

4.	The reason for the implementation of the cache memory is:
A.	To increase the internal memory of the system
✓(B.)	The difference in speeds of operation of the processor and memory ✓
C.	To reduce the memory access and cycle time
D.	A and C

5.	In which context the system should provide mechanisms for cache coherency
A.	When many programs run in the same CPU
(B.)	When many programs run in many CPUs ✓
C.	When many programs run on different computers
D.	When the system saves the context of one process and load the context of another.

6.	What is the meaning of privilege escalation?
A.	When a program requests a service from the OS.
B.	When a hardware send an interrupt to the CPU
C.	When the OS detects a serious problem in the hardware
(D.) ✓	When a user can change his effective ID to get more rights temporarily

7.	When Swapping should be used:
(A.)	When the main memory cannot contain all the processes that need to execute ✓
B.	When the system can execute processes at a very high speed.
C.	Only when using batch processing
D.	When one programs writes to the disk while another program reads from the disk.

8.	When a system has 4 processors: 1 general purpose processor, 1 Digital Signal Processor (DSP), 1 3D graphics processor, 1 Image and Video accelerator, It can be called
A.	Asymmetric cluster system
B.	Symmetric cluster system
(C.)	Asymmetric Multiprocessing ✓
D.	Symmetric Multiprocessing

2016-2017
OS mid1

Time: 6:30pm – 8:00pm (90 minutes)
Name:
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CSC227

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9.	The set of System Calls that can be used by a program or a library to invoke services from the operating systems is
A.	Application Binary Interface (ABI)
B.	Application programming interface (API)
C.	Instruction Set Architecture
D.	A and B except "Recovering from errors".

10.	When programmers develop applications in high level language. In the code they usually
A.	Write system calls
B.	Use an Application programming Interface (API)
C.	Write machine language instructions
D.	All of the above

11.	In Uni-programming vs. Multiprogramming, Uni-programming usually lead to
A.	Higher CPU utilization
B.	Lower CPU utilization
C.	Has no effect on CPU utilization
D.	Better user interface

12.	Assume a processor that has one job which requires: reading from a file (95ms), Executing 10 instructions(10 ms), and writing to a file (95ms)
A.	CPU is often busy.
B.	CPU is never used
C.	CPU is mostly idle
D.	None of the above

13.	In microkernel approach communication is provided:
A.	Through registers
B.	Through message passing
C.	Through stack
D.	Through hard disk

14.	Performance overhead in microkernel approach is because of:
A.	Time it takes to design microkernel
B.	Communication between application and hardware
C.	User space to kernel space communication
D.	Communication between application and users

15.	Common bootstrap loader, GRUB is used to:
A.	Allow install multiple OS on a system
B.	Allow selection of kernel from multiple disks, versions, kernel options
C.	Allow selection of process from multiple processors
D.	Allow use of multiple Oss simultaneously.

16.	Registry is an example of:
A.	System call
B.	Parameter passing
C.	Background service
D.	System program

Copy your answer for question 1-1 to 1-16 in the following table:

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
D	A	B	B	B	D	A	C	B	B
11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
B	A	B	C	B					

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Question 3. [3 Marks]

3.1 Give a definition of a Real-Time Operating System:

A Real-time system has well-defined fixed time, Processing must be done in time or system fail.

هي نظام تلتزم بالـ ـ وفي حال عدم الالتزام بالوقت يخرب النظام

3.2 The operating system provides process communication and process synchronization among many activities in connection with process management. Explain what synchronization is and why it may be needed.

OS Provid synchronization ماهي المزامنة؟

for example producer and consumer can not Access Shared Memory at the same time

OS يوفر المزامنة وتدل على ذلك ام محمد وام امير لا يتعاملوا مع المطبخ في نفس الوقت

3.3 Emulation is in general much slower than Virtualization. Why? [1 mark]

لماذا Emulation ابطأ من Virtualization لماذا؟

because each instruction that run on the source system must be translated to target system

لان كل امر سوف ينفذ على النظام الاساسي لابد ان يحول الى امر قابل للتنفيذ على النظام الهدف.

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Question 4. [3 Marks]

2.5/3

.1 The simplest method for system call parameter passing is by passing the parameters via registers? [1.5 marks]

(a)Discuss the disadvantages of this approach? [0.5 mark]

The number of Parameters is Greater than Registers

(b) What are the alternatives? [1 mark]

ماهي البدائل

✓ • by [redacted] Pushed Parameters from Program into stack and Pop it by OS

✓ • by Put Parameters in block in ram and send the address register

.2 Operating systems provide several services such as the user interface (UI) and resource allocation [1.5 marks]

1/1.5

- List two possible types of User Interfaces. [0.75 marks]

1- Graphical user interface GUI

2- command line interface CLI

3- Batch

- List three possible resources that can an operating system allocate. [0.75 marks]

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1- Memory

2- CPU

3- I/O devices

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Question 5 [3 Marks] ....Student's ID..

5.1 What do we mean by operating system generation using SYSGEN? [1.5 marks]

.....SYSGEN: Program obtain information concerning of specific.....
.....configuration to the hardware system.....
.....

5.2 What is the main advantage of the layered approach to system design? What are the disadvantages of using the layered approach? [1.5 marks]

..main advantage is easy to construct and debugging.....
.disadvantages are:.....
.how to define the layers.....
.each layer should has function of its dependent layer.....

END OF EXAM