Student's Name:..... Student's ID.....2[illegible]9.....

Question 1. [6 Marks: CLO (a)] Select ONLY ONE ANSWER (the best answer).

Copy your answer for question 1-1 to 1-16 in the table on page2. ONLY THAT TABLE WILL BE GRADED.

1.	The one program running at all times on the computer is:
(A.)	Kernel
B.	Application program
C.	Bootstrap program
D.	System call

2.	From users perspectives an operating system should:
A.	Be easy to use
B.	Has good performance
C.	Provide features required by users if possible
(D.)	All of the above

3.	Trap or exception is:
A.	a hardware-generated interrupt caused by a faulty hardware.
B.	An interrupt generated by an I/O controller, to signal normal completion of an operation.
C.	Generated by a timer within the processor
(D.)	a software-generated interrupt caused either by an error or a user request

4.	Program counter specifies:
(A.)	Location of next instruction to execute
B.	Location of previous instruction executed
C.	Location of current instruction that is in execution
D.	Location of the first instruction executed

5.	Cache coherency in multiprocessor environment is that:
(A.)	All CPUs have the most recent value in their cache
B.	All CPUs have the previous value in their cache
C.	All CPUs have the next value in their cache
D.	All CPUs have most recent value in the main memory

6.	File-server system provides an interface for clients:
(A.)	To store and retrieve files
B.	To request services from a server
C.	To store files
D.	To process files

7.	When it is necessary to send a large amount of data to a system call, which method is the best to use
A.	Put parameters in a file and put the file location in a register. The system call code will read the file to access the data.
B.	Save the data in a server and put the server address in a register. The system call code will contact the server to get the data.
C.	Put each data in a separate register. The system call code will directly access the registers to read the data.
(D.)	Write the data in an allocated memory area and put the memory area address in a register. The system call code will use the address to access the data from memory.

8.	When a system has many processes to execute, what is the advantage of using Time-Sharing scheduling?
(A.)	The process will execute and terminate faster
(B.)	The process can be interactive.
C.	The processes will use less memory.
D.	To process files

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9.	Which one of the following OS functions keeps track of which users use computer resources and how much and what kinds of computer resources are used by a specific user?
A.	Accounting
B.	Resource Allocation
C.	Protection and security
D.	Error detection

10.	The Design and Implementation of OS are not "solvable", but some goals have to be considered:
A.	User goals
B.	System goals
C.	User and system goals
D.	User goals but not the system goals

11.	In a layered operating system structure:
A.	Layers are selected such that each uses functions and services of only the most inner layer.
B.	layers are selected such that each uses operations and services of only upper-level layers
C.	layers are selected such that each uses functions and services of only lower-level layers
D.	None of the above.

12.	Emulation can:
A.	allow an OS to run on non-native hardware
B.	duplicate the functionality of one system on another system
C.	not help to make a Dos program running on Mac hardware
D.	A and B

Please copy your answer for question 1-1 to 1-12 in the following table:

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
A	D	D	A	A	A	D	B	BA	C

11.	12.
D	A

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Question 2. [3.5 Marks: CLO (a)]

2.1 Storage systems shown in Figure1 bellows are organized in hierarchy based on three factors? List at least two factors. **(1 Mark)**

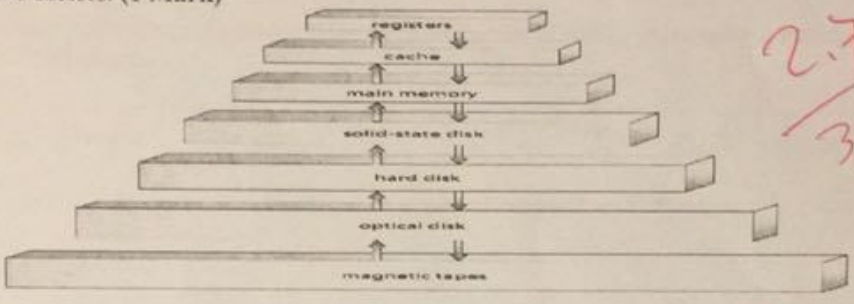

Figure 1.

Factor 1:	Your answer here: Cost
Factor 2:	Your answer here: Speed
Factor 3:	Your answer here: Volitre (متطايرة)

2.2 Assume a variable "**B777**" has the following values in the following locations:

Table.1 shows Variable "B777" values and location

Value	Location
2	Register
4	Cache
4	Main Memory
8	Hard Disk

2.2.1 Can this be a realistic reflection of B777 values in various storage systems? Yes or No **(0.5 Mark)**

Yes or No	Your answer goes here: yes

2.2.2 What are the current value of B777 (based on Table.1)? **(0.5 Mark)**

Current Value	Your answer goes here: 8

2.2.3 Assume an accidental shut down occur at the moment, based on Table.1 what will be the value of B777 after starting up the computer? **(0.5 Mark)**

Value of B777 after staring:	Your answer goes here: ~~No data~~ 8

2.3 For I/O operation there are three possible techniques namely:

A. Programmed I/O	B. Interrupt driven I/O	C. Direct memory Access

2.3.1 If you have the choice to choose one of the three techniques, which one would you choose and why? **(1. Mark)**

A, B, or C	Your answer goes here: C
Why?	Your answer goes here: it send Block of data rether than bit by bit and it fast

Center
organization unite whose mi
...ort was - in technology
- Install new hard or soft w.
Answer Questions
work with
2 = h.

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Question 3. [3.5 Mark] 3 2.5

3.1 What is the main difficulty that a programmer must overcome in writing an operating system for a real-time environment? **(0.5Mark).**

real time: If the Programme not finshin SPsifec tine that mean it will faill all.

3.2 Write major features of P2P computing environment. **(1.5 Mark).**

P2P that mean evry Computer work as Clinte and Server

3.3 Differentiate between emulation and virtualization. **(1.5 Mark).**

Allow an OS to run on non native hard ware

Emulation: ~~it for ran the System in my system~~
~~any sy~~ taasp of ~~system can runt in the~~
cpu ~~windows and~~ x83

1.25

Virtualization: evre gest System have an CPU and momary (مؤقت)

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Question 4. [3.5 Mark] 10

4.1 System calls are usually performed through library APIs. What is the advantage of calling API calls rather than directly calling the system calls? (CLO3) – SO(a) **(1 Mark)**

API is more flexble and raibilice to use

4.2 The Instruction Set Architecture (ISA) defines the repertoire of machine language instructions that a computer can follow / execute. These are the instructions executed by the processor. Is it possible that system programs and application programs use some ISA instructions directly? Explain. CLO2 – SO(a) **(1 Mark)**

4.3 List four different system calls in each one of the below categories? (CLO3) – SO(a) **(1.5 Mark)**

4.3.1 In process control: 1/0

1	end ✓	end
2	Carreat ✓	Careat
3	~~write~~	waite
4		abourt

4.3.2 Device management:

1	~~open~~ read ✓	
2	write ✓	
3	~~recive~~	recivals
4		requests

4.3.3 Communications:

1	open	what?	recive
2	delete	what?	Send
3	~~send~~ recive	What?	&
4			

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Question 5. [3.5 Mark] SO(c)

5.1 What are the three general methods used to pass parameters to the Operating System? **(1 Mark)**

1.	Useing register ✓
2.	useing Stark ~~BP~~ and Push from Program (1)
3.	useing ~~bele~~ bloke and bat the address in regster

5.2 Specifying and designing an operating system is a highly creative task and general principles have been developed in the field of software engineering such as the important principle to separate policy and mechanism. (0.25+0.25+ 0.5=1.5 Mark).

5.2.1 Describe the definition of the Policy:

Policy is (what) will do? ✓

5.2.2 Describe the definition of the mechanism:

mechanism (How) can doIt? ✓ (1.5)

5.2.3 What is the main advantage of such separation?

its more ~~to~~ ~~Exebite~~ Flexiblite ✓

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5.3 Describe the structure of the Microkernel operating system with respect to the Kernel operating system. **(0.5 Mark)**

in microkernel ~~not~~ we will move lots of thing from kernel mode to user mode to make the kernel smaller more secure and more fast.

5.3 Completer the following diagram of the Microkernel operating system structure. **(0.5 Mark)**

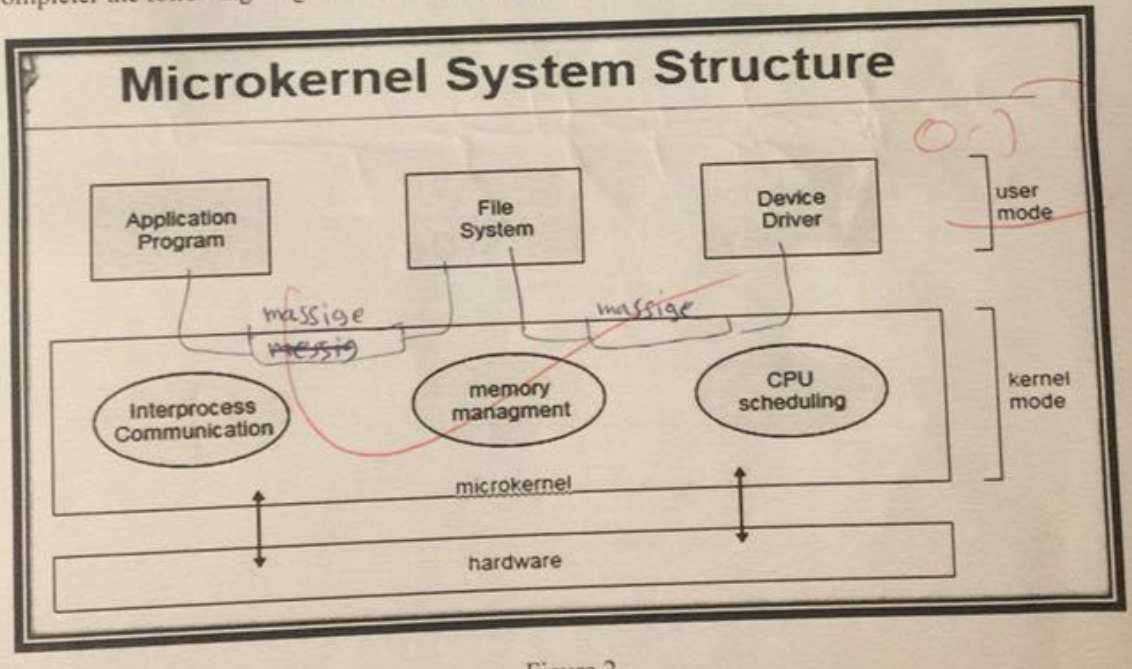

Figure 2.

END OF THE EXAM.