Choose the best answer among the multiple choices, then fill the table in the second page with your answers.

1) Operating systems for mainframes (multiple users) should he designed to.........

A. maximize resource utilization.

C. run without user intervention.

B. increase battery life.

D. increase individual usability.

2) An operating system can be divided into four components including hardware.

A. True.

B. False.

3) System calls change mode to ……. then the return from calls reset it to ……. mode.

A. kernel, kernel

C. kernel, user

B. user, kernel

D. user, user

4) Protection is an operating system service which involves the following:

A. Utilizing resources efficiently.

B. Ensuring that all access to system resources is controlled.

C. Requiring user authentication extends to defending external I/O devices from invalid access attempts.

D. Ensuring that communication is under the control of the users processes not the operating system.

5) .... is/are not a technique for passing parameters from an application to a system call.

A. Cache memory

B. Stack

C. Registers

D. Special block in memory

6) The …… multithreading model multiplexes many user-level threads to a smaller or equal number of kernel threads.

A. many-to-one model

C. many-to-many model

B. one-to-one model

D. many-to-some model

7) Modern operating systems are said to be .... driven.

A. Program

C. interrupt

B. trap

D. exception

**8) Kernels are generally multithreaded.**

A. True.

B. False.

9) Which of the following describes the relationship between independent processes?

A. They do not affect or be affected by other processes executing in the system.

B. They can affect or be affected by other processes in the system.

C. They require intercommunication between each other.

D. B and C.

10) Which of the following is Not True?

A. Processes carry a large amount of state information compared to threads.

B. Process creation is faster than thread creation.

C. Processes have separate address spaces.

D. Context switching between processes is slower than between threads.

11) Assuming that there are two processes P1 and P2, both share variable X without using any synchronization mechanism, P1 does an addition on X, while P2 does a multiplication on X.

P_1	P_2
$X = X \oplus X$	$X = X \odot X$
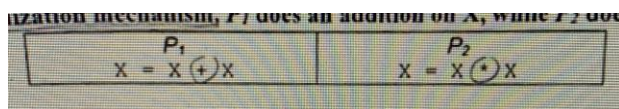
The above description is an example situation of ....

A. race condition

C. synchronization

B. mutual exclusion

D. bounded waiting

12) A Correct order of process's states over time is ....

A. New --> running --> waiting --> terminated.

B. New --> ready --> running --> waiting.

C. New --> waiting --> running --> terminated.

D. New --> ready --> running --> terminated.

13) Which of the following components is responsible for giving control of the CPU to the selected process?

A. Dispatcher   C. CPU scheduler

B. ALU   D. Kernel

14) Binary Semaphores allow multiple processes to access their critical section simultaneously.

A. True   B. False

I. Fill in the blank.

A ……….. is a fundamental unit of CPU utilization that forms the basis of multithreaded computer systems.

II. What are the two types of Parallelism?

Fill in the blanks (A and B) in the following test and set instruction code.

boolean test_and_set (boolean *target)

       {

         boolean rv = *target;

        *target = ……………………………….; (A)

         return …………….. ;(B)

     }

Consider four processes Pa, Pb, Pc, and Pd with the burst times 8, 5, 1, 6 ms, respectively. All the processes arrived at time 0, with the order Pa, Pb, Pc, Pd.

process	Burst time
Pa	8
Pb	5
Pc	1
Pd	6

1. Draw the Gantt chart of the processes' execution if the CPU scheduling algorithm is SJF.

----

2. Draw the Gantt chart of the processes' execution if the CPU scheduling algorithm is RR given the time quantum q = 5 ms.

----

3. Find the average waiting time using both algorithms? Specify which algorithm is better?

Choose the best answer among the multiple choices, then fill the above table with your answers.

1) In which of the following CPU scheduling algorithms, the convoy effect may happen?

A. FCFS   B. SJF

C. RR   D. None of the above

2) The following statements are correct EXCEPT

A. system is in safe state when no deadlock is found.

B. When a system allocates resources to some processes, that system is safe.

C. A system is unsafe when there are one or more deadlocks.

D. Initially, a system is in a safe state.

3) A memory management scheme that permits the physical address space of a process to be non-contiguous is………………………

A. Paging   C. Contiguous allocation

B. Swapping   D. Thrashing

4) In demand paging, which of the following statement is incorrect?

A. Never swaps a page into memory unless that page is needed.

B. With each page table entry, a valid-invalid bit is needed.

C. When a page has invalid bit value, the OS will always abort the process of that page,

D. First reference to an invalid page will result in page fault.

5) Suppose a program is operating with execution-time binding and the physical address generated is 300. The relocation register is set to 100. What is the corresponding logical address?

A. 300   B. 100

C. 400   D) 200

6) The .... memory allocator is better than .... in terms of speed.

A. first-fit;   worst-fit

B. best-fit;   first-fit

C. first-fit;   best-fit;

D. A and C

7) In comparing two CPU scheduling algorithms, the algorithm with lower throughput is considered a better algorithm.

A. True   B. False

Answer the following questions:

I. Fill in the blanks in steps 2 and 5 as shown in the right figure of page fault handling steps.

(2) -----------------------

(5) -----------------------
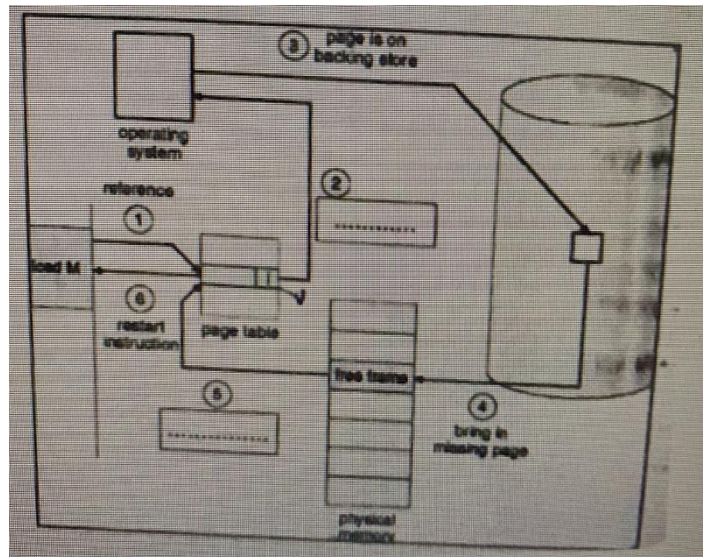
II. List to benefits of having several processes in the main memory simultaneously

----

Given a page size of 1,024 bytes and the size of the process Is 20500 bytes, Determine the size of the internal Fragmentation, if any.

Consider the following snapshot of a system.

	Allocated				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
PO	0	0	1	2	0	6	5	6	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	0	1	5				

I. what la the need for the process, P0 and P3?

II. if a request from process P1 arrives for (1, 0, 0, 0), can the request be granted immediately? why?

----

iii. if a request from process P4 arrives for (0, 0, 0, 1), can the request be granted immediately? why?

Question 18

💬

Privileged instruction can be executed in the user mode

- ○ True
- ○ False

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Question 17

Operating systems need to be constantly aware of possible errors

- ◉ True
- ○ False

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uestion 16

Core dump file is created in the event of operating system failure and contains kernel memory

- ○ True
- ○ False

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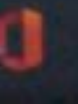Moving to the next question prevents changes to this ans

Question 15

Ready queue consists of all processes in the system
- ○ True
- ○ False

⚠ Moving to the next question prevents changes to this answer.

Question 14

One of the approaches to solve the deadlock in Dining-Philosopher problem is

- ⚪ Allow all the philosopher to be sitting simultaneously at the table
- ⚪ Allow a philosopher to pick up the chopstick when one only is available
- ⚪ Allow a philosopher to pick up the chopsticks when both are available
- ⚪ Allow No philosopher to set be sitting at the table.

⮕ ⚠ Moving to the next question prevents changes to this answer.

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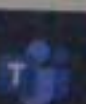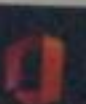
Question 13

Question

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"
.... means when a process Pi is executing in its critical section, then no other process can execute its critical section "

- ○ Mutual exclusion
- ○ Progress
- ○ Bounded waiting
- ○ Race condition

Question

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⚠ Moving to the next question prevents changes to this answer.

Question 12

Peterson's solution for critical-section problem is restricted to
- ⃝ Only one process
- ⃝ Three processes
- ⃝ Two processes
- ⃝ Only four processes

⚠ Moving to the next question prevents changes to this answer.

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Question 11

The.............. Multithreading model maps many user-level threads to one kernel thread

○ Many-to-many model
○ Many-to-many model
○ Many-to-one model
○ Two-level model

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Question 10

One of the following statements is Not True in regard to ordinary pipes
- ○ Allow two processes to communicate in standard producer-consumer manner
- ○ Allowing only one way of communication
- ○ Can be accessed from outside the process that created it
- ○ Require a parent-child relationship

Question 9

Almost all operating systems provide a .... that can take several forms such as CLI and GUI

- ○ Program execution
- ○ I/O operations
- ○ User interface
- ○ File-system management

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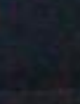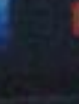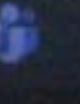
Question 8

.... can allow an operating system to run on non-native hardware

○ Kernel
○ Emulation
○ Application programms
○ MS-DOS

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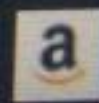
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Question 7

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......................is a collection of separate heterogeneous systems networked together to provide users with access to various resources

○ Handheld computers
○ Client-server system
○ Distributed computing systems
○ Personal Computer

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Question 6

................is one of the operating system activities in regard to process management

○ Backup files into stable storage device
○ Creating and deleting files and directories
○ Providing mechanisms for process communication
○ Allocating and deallocating memory space

Question 5

A process is ....:

- ◯ A passive entity
- ◯ A program in execution
- ◯ A part of hardware that is static
- ◯ An operating system model

Question 4

A........... is added to the hardware of a computer to indicate the current mode

○ Mode bit
○ software bit
○ Program bit
○ Operating system bit

Question 3

0.5 points   Save Answer

Processes can be described as either I/O-bound process or CPU-bound process. Briefly explain why it is important for the long-term scheduler to select a good mix of these process?

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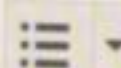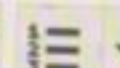
Question 2

2 points   Save Answer

Cooperating processes need interprocess communication (IPC) mechanism that allows them to exchange data and information. List two models of IPC and briefly explain each model

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uestion 1

Differentiate between Asymmetric multiprocessing and Symmetric multiprocessing ?

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