Started on	Monday, 1 February 2021, 3:00 PM
State	Finished
Completed on	Monday, 1 February 2021, 3:30 PM
Time taken	30 mins
Grade	**22.50** out of 30.00 (**75**%)

Question **1**

Incorrect

Mark 0.00 out of 1.00

Which of the following clearly tells the difference between the two block states : Block and Block/suspend?

Select one:

- In the main memory waiting for an event / swapped out to wait
- Waiting for IO / waiting for nonIO ✖
- blocked by event / blocked by semaphore
- blocked for event / no place in queue.

The correct answer is: In the main memory waiting for an event / swapped out to wait

Question **2**

Correct

Mark 1.00 out of 1.00

Switching the CPU to another Process requires to save state of the old process and loading new process state is called as _____.

Select one:

- Context Switch ✔
- Process Blocking
- Scheduler
- Time Sharing

The correct answer is: Context Switch

Question **3**

Correct

Mark 1.00 out of 1.00

A shared variable 'M' initialized to zero is operated on by four concurrent processes W, X, Y, Z as follows. Each of the processes W and X reads M from memory increments by one stores it to memory, and then terminates. Each of the processes Y and Z reads M from memory decrements by two, stores it to memory and then terminates. Each process before reading M invokes the P operation on a counting semaphore S and invokes the V operation on the semaphore S after storing M to memory. Semaphore S is initialized to two. What is the maximum possible value of M after all processes complete execution?

Select one:

- 1
- 2 ✔
- -2
- -1

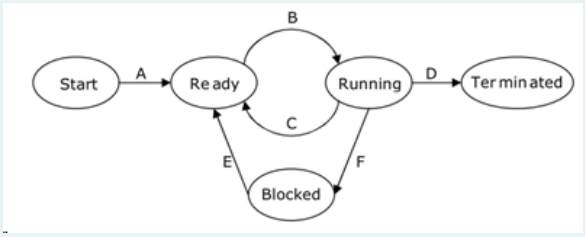
The correct answer is: 2

Question **4**

Correct

Mark 1.00 out of 1.00

In the following process state transition diagram for a uniprocessor system, assume that there are always some processes in the ready state:



Now consider the following statements:

I. If a process makes a transition D, it would result in another process making transition A immediately.

II. A process P2 in blocked state can make transition E while another process P1 is in running state.

III. The OS uses preemptive scheduling.

IV. The OS uses non-preemptive scheduling.

Which of the above statements are TRUE?

Select one:

- II and IV
- II and III ✔
- I and II
- I and III

The correct answer is: II and III

Question **5**

Correct

Mark 1.00 out of 1.00

Which of the following is an advantage of system level threads?

Select one:

- A thread blocking in the kernel doesn't stop all other threads in the same process
- Different threads can be scheduled on different processors in a multicore machine.
- Each thread can be scheduled separately, rather than using the time slice of one process over many
- All of the above ✔

The correct answer is: All of the above

Question **6**

Correct

Mark 1.00 out of 1.00

Let us consider a pre-emptive Shortest Job First scheduling where process A arrives at time 0 and needs to run for 1 hour. From the start time 0, other (short) processes will arrive every 1 minute and run for 2 minutes each. This situation will cause

Select one:

- Deadlock for all processes
- Priority Inversion
- Starvation for process A ✔
- Starvation for the short processes

The correct answer is: Starvation for process A

Question **7**

Incorrect

Mark 0.00 out of 1.00

Suppose we want to synchronize two concurrent processes P and Q using binary semaphores S and T. The code for the processes P and Q is shown below.

Process P:	Process Q:
while (1) {	while (1) {
W:	Y:
Print '0';	Print '1';
Print '0';	Print '1';
X:	Z:
}	}

Synchronization statements can be inserted only at points W, X, Y, and Z. Which of the following will always lead to an output starting with '001100110011'?

Select one:

- P(S) at W, V(T) at X, P(T) at Y, V(S) at Z, S initially 1, and T initially 0
- P(S) at W, V(S) at X, P(T) at Y, V(T) at Z, S and T initially 1 ✖
- P(S) at W, V(S) at X, P(T) at Y, V(T) at Z, S initially 1, and T initially 0
- P(S) at W, V(T) at X, P(T) at Y, V(S) at Z, S and T initially 1

The correct answer is: P(S) at W, V(T) at X, P(T) at Y, V(S) at Z, S initially 1, and T initially 0

Question **8**

Correct

Mark 1.00 out of 1.00

Preemptive scheduling is the strategy of temporarily suspending a running process

Select one:

- To allow starving processes to run
- When it requests (I/O)
- Before the CPU time slice expires ✔

The correct answer is: Before the CPU time slice expires

Question **9**

Correct

Mark 1.00 out of 1.00

Which of the following statements are true?

I. Shortest remaining time first scheduling may cause starvation

II. Preemptive scheduling may cause starvation

III. Round robin is better than FCFS in terms of response time.

Select one:

- I and III only ✔
- I, II and III
- I only
- II and III only

The correct answer is: I and III only

Question **10**

Correct

Mark 1.00 out of 1.00

Let the time taken to switch between user and kernel modes of execution be t_1 while the time taken to switch between two processes be t_2. Which of the following is TRUE?

Select one:

- $t_1 = t_2$
- No relation between t_1 and t_2
- $t_1 > t_2$
- $t_1 < t_2$ ✔

The correct answer is: $t_1 < t_2$

Question **11**

Correct

Mark 1.00 out of 1.00

Three concurrent processes X, Y, and Z execute three different code segments that access and update certain shared variables. Process X executes the P operation (i.e., wait) on semaphores a, b and c; process Y executes the P operation on semaphores b, c and d; process Z executes the P operation on semaphores c, d, and a before entering the respective code segments. After completing the execution of its code segment, each process invokes the V operation (i.e., signal) on its three semaphores. All semaphores are binary semaphores initialized to one. Which one of the following represents a dead lock free order of invoking the P (wait) operations by the processes?

1. X : P (a) P(b) P(c) Y : P (b) P (c) P (d) Z : P (c) P(d) P(a)
2. X : P(b) P (a) P(c) Y : P(b) P (c) P(d) Z : P(a) P(c) P(d)
3. X : P(b)P (a) P(c) Y : P(c) P(b) P (d) Z : P(a) P(c) P(d)
4. X : P (a)P (b) P(c) Y : P(c) P (b) P(d) Z : P(c) P(d) P(a)

Select one:

- 1 and 4 only
- 2 only ✔
- 3 only
- 1 and 3 only

The correct answer is: 2 only

Question **12**

Incorrect

Mark 0.00 out of 1.00

Consider the following three jobs:

Job A – needs a CPU cycle of 15 milliseconds.

Job B – needs a CPU cycle of 2 milliseconds.

Job C – needs a CPU cycle of 1 millisecond.

Assume all of them arrived almost simultaneously, what is the average turnaround time using FCFS with arrival sequence A, B, C

Select one:

- 10 ms
- 10.6 ms
- 16.7 ms ✔
- 16 ms

The correct answer is: 16.7 ms

Question **13**

Incorrect

Mark 0.00 out of 1.00

Which of the following will be shared between all of the threads in a process? Assume a kernel-level thread implementation?

Select one:

- Local variables
- File descriptors
- Scheduler priority
- Register values ✖

The correct answer is: File descriptors

Question **14**

Correct

Mark 1.00 out of 1.00

To avoid race condition, the maximum number of processes that may be simultaneously inside the critical section is

Select one:

- 2
- 1 ✔
- 0
- more than 2

The correct answer is: 1

Question **15**

Incorrect

Mark 0.00 out of 1.00

In which of the following scheduling policies does context switching never take place when all processes are CPU bound one?

Select one:

- Non-preemptive Shortest job first ✖
- First come first served
- Round – robin

The correct answer is: First come first served

Question **16**

Correct

Mark 1.00 out of 1.00

In process scheduling _____ determines when new processes are admitted to the system.

Select one:

- medium term scheduling
- short term scheduling
- long term scheduling ✔

The correct answer is: long term scheduling

Question **17**

Correct

Mark 1.00 out of 1.00

With the round robin CPU scheduling in a time-shared system, _____.

Select one:

- Using extremely small time slices degenerate in to last in first out algorithm
- Using very large time slice degenerates in to first come first served algorithm ✔
- Using medium sized time slices leads to shortest request time first algorithm
- Using extremely small time slices improve performance

The correct answer is: Using very large time slice degenerates in to first come first served algorithm

Question **18**

Incorrect

Mark 0.00 out of 1.00

Consider Peterson's algorithm for mutual exclusion between two concurrent processes i and j. The program executed by process is shown below.

```
repeat
        flag[i] = true;
        turn = j;
        while (P) do no-op;
        <Critical Region>
        flag[i] = false;
until false;
```

for the program to guarantee mutual exclusion, the predicate P in the while loop should be

Select one:

- flag[i] ==true && turn = j
- flag[i] ==true && turn = i ✖
- flag[j] ==true && turn = j
- flag[j] ==true && turn = i

The correct answer is: flag[j] ==true && turn = j

Question **19**

Correct

Mark 1.00 out of 1.00

_____ are very effective because a mode switch is not required to switch from one thread to another.

Select one:

- Kernel-level threads
- User-level threads ✔
- Application level threads
- Alterable threads

The correct answer is: User-level threads

Question **20**

Correct

Mark 1.00 out of 1.00

Program 'preemption' is

Select one:

- forced allotment of CPU by a program to itself
- a program terminating itself due to detection of an error
- release of CPU by the program after completing its task
- forced de-allocation of the CPU from a program which is executing on the CPU ✔

The correct answer is: forced de-allocation of the CPU from a program which is executing on the CPU

Question **21**

Correct

Mark 1.00 out of 1.00

Using Priority Scheduling algorithm, find the average waiting time for the following set of processes given with their priorities in the order: Process : Burst Time : Priority respectively . P1 : 10 : 3 , P2 : 1 : 1 , P3 : 2 : 4 , P4 : 1 : 5 , P5 : 5 : 2.

Select one:

- 8.2 milliseconds ✔
- 8 milliseconds
- 7.75 milliseconds
- 3 milliseconds

The correct answer is: 8.2 milliseconds

Question **22**

Incorrect

Mark 0.00 out of 1.00

In each of the following, you will be given a hypothetical sequence of states that a process enters during its lifetime. Which one is possible in a system with preemptive scheduling but not possible with non-preemptive scheduling?

Select one:

- New → Ready → Running →Waiting → Ready → Running → Terminated ✖
- New → Ready → Running → Ready → Running → Terminated
- New → Ready → Running → Waiting → Running → Terminated
- New → Ready → Running → Terminated

The correct answer is: New → Ready → Running → Ready → Running → Terminated

Question **23**

Correct

Mark 1.00 out of 1.00

A scheduling algorithm assigns priority proportional to the waiting time of a process. Every process starts with priority zero (the lowest priority). The scheduler re-evaluates the process priorities every T time units and decides the next process to schedule. Which one of the following is TRUE if the processes have no I/O operations and all arrive at time zero?

Select one:

- This algorithm is equivalent to the round-robin algorithm ✔
- This algorithm is equivalent to the first-come-first-serve algorithm
- This algorithm is equivalent to the shortest-job-first algorithm
- This algorithm is equivalent to the shortest-remaining-time-first algorithm

The correct answer is: This algorithm is equivalent to the round-robin algorithm

Question **24**

Correct

Mark 1.00 out of 1.00

In which operating systems response time is crucial?

Select one:

- Realtime ✔
- Batch
- Network

The correct answer is: Realtime

Question **25**

Correct

Mark 1.00 out of 1.00

Aging is a technique used to _____

Select one:

- Decrease the priority of processes waiting for long time
- Increase the priority of processes that are currently running
- Decrease the priority of processes that are currently running
- Increase the priority of processes that are waiting for long time ✔

The correct answer is: Increase the priority of processes that are waiting for long time

Question **26**

Correct

Mark 1.00 out of 1.00

Two processes, P1 and P2, need to access a critical section of code. Consider the following synchronization construct used by the processes:

/* P1 */	/* P2 */
while (true) {	while (true) {
wants1 = true;	wants2 = true;
while (wants2 == true) ;	while (wants1 == true) ;
<< Critical Section >>	<< Critical Section >>
wants1 = false;	Wants2 = false;
}	}
<< remainder section >>	<< remainder section >>

Here wants1 and wants2 are shared variables, which are initialized to false. Which one of the following statements in TRUE about the above construct?

Select one:

- It does not ensure bounded waiting
- It requires that processes enter the critical section in strict alteration
- It does not prevent deadlocks, but ensures mutual exclusion ✔
- It does not ensure mutual exclusion

The correct answer is: It does not prevent deadlocks, but ensures mutual exclusion

Question **27**

Correct

Mark 1.00 out of 1.00

Some computer systems support dual mode operation-the user mode and the kernel mode – These refer to the modes

Select one:

- by which the operating system executes user programs
- by which user programs handle their data
- in which the processor and the associated hardware operate ✔
- of memory access

The correct answer is: in which the processor and the associated hardware operate

Question **28**

Correct

Mark 1.00 out of 1.00

A process which has just terminated but has yet to relinquish its resources is called

Select one:

- A suspended process
- A terminated process
- A blocked process
- A zombie process ✔

The correct answer is: A zombie process

Question **29**

Correct

Mark 1.00 out of 1.00

Let us consider a pre-emptive Shortest Job First scheduling where process A arrives at time 0 and needs to run for 1 hour. From the start time 0, other (short) processes will arrive every 1 minute and run for 2 minutes each. This situation will cause

Select one:

- Starvation for the short processes
- Starvation for process A ✔
- Deadlock for all processes
- Priority Inversion

The correct answer is: Starvation for process A

Question **30**

Partially correct

Mark 0.50 out of 1.00

Which of the following are (virtually) shared by threads within a single process? In other words, is it instantiated per process instead of per thread? Select all that apply.

Select one or more:

- Global variables
- Code / Program Text ✔
- Registers
- Stack

The correct answers are: Global variables, Code / Program Text

◄ Tutorial - Problems From Memory Management

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CA Test 1 ►

Started on	Thursday, 18 February 2021, 3:25 PM
State	Finished
Completed on	Thursday, 18 February 2021, 4:25 PM
Time taken	1 hour
Grade	**28.00** out of 40.00 (**70**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Consider Peterson's algorithm for mutual exclusion between two concurrent processes i and j. The program executed by process is shown below.

```
repeat
        flag[i] = true;
        turn = j;
        while (P) do no-op;
        <Critical Region>
        flag[i] = false;
until false;
```

for the program to guarantee mutual exclusion, the predicate P in the while loop should be

Select one:

- flag[i] ==true && turn = j
- flag[j] ==true && turn = i
- flag[i] ==true && turn = i
- flag[j] ==true && turn = j ✔

The correct answer is: flag[j] ==true && turn = j

Question **2**

Correct

Mark 1.00 out of 1.00

Let us consider a pre-emptive Shortest Job First scheduling where process A arrives at time 0 and needs to run for 1 hour. From the start time 0, other (short) processes will arrive every 1 minute and run for 2 minutes each. This situation will cause

Select one:

- Starvation for process A ✔
- Deadlock for all processes
- Starvation for the short processes
- Priority Inversion

The correct answer is: Starvation for process A

Question **3**

Correct

Mark 1.00 out of 1.00

Using Priority Scheduling algorithm, find the average waiting time for the following set of processes given with their priorities in the order: Process : Burst Time : Priority respectively . P1 : 10 : 3 , P2 : 1 : 1 , P3 : 2 : 4 , P4 : 1 : 5 , P5 : 5 : 2.

Select one:

- 8.2 milliseconds ✔
- 8 milliseconds
- 3 milliseconds
- 7.75 milliseconds

The correct answer is: 8.2 milliseconds

Question **4**

Correct

Mark 1.00 out of 1.00

Which of the following are (virtually) shared by threads within a single process? In other words, is it instantiated per process instead of per thread? Select all that apply.

Select one or more:

- Global variables ✔
- Code / Program Text ✔
- Stack
- Registers

The correct answers are: Global variables, Code / Program Text

Question **5**

Correct

Mark 1.00 out of 1.00

A scheduling algorithm assigns priority proportional to the waiting time of a process. Every process starts with priority zero (the lowest priority). The scheduler re-evaluates the process priorities every T time units and decides the next process to schedule. Which one of the following is TRUE if the processes have no I/O operations and all arrive at time zero?

Select one:

- This algorithm is equivalent to the shortest-remaining-time-first algorithm
- This algorithm is equivalent to the shortest-job-first algorithm
- This algorithm is equivalent to the round-robin algorithm ✔
- This algorithm is equivalent to the first-come-first-serve algorithm

The correct answer is: This algorithm is equivalent to the round-robin algorithm

Question **6**

Correct

Mark 1.00 out of 1.00

Which of the following statements are true?

I. Shortest remaining time first scheduling may cause starvation

II. Preemptive scheduling may cause starvation

III. Round robin is better than FCFS in terms of response time.

Select one:

- II and III only
- I only
- I and III only ✔
- I, II and III

The correct answer is: I and III only

Question **7**

Correct

Mark 1.00 out of 1.00

Some computer systems support dual mode operation-the user mode and the kernel mode – These refer to the modes

Select one:

- of memory access
- by which the operating system executes user programs
- in which the processor and the associated hardware operate ✔
- by which user programs handle their data

The correct answer is: in which the processor and the associated hardware operate

Question **8**

Correct

Mark 1.00 out of 1.00

Which of the following clearly tells the difference between the two block states : Block and Block/suspend?

Select one:

- In the main memory waiting for an event / swapped out to wait ✔
- Waiting for IO / waiting for nonIO
- blocked for event / no place in queue.
- blocked by event / blocked by semaphore

The correct answer is: In the main memory waiting for an event / swapped out to wait

Question **9**

Correct

Mark 1.00 out of 1.00

Switching the CPU to another Process requires to save state of the old process and loading new process state is called as _____.

Select one:

- Scheduler
- Time Sharing
- Context Switch ✔
- Process Blocking

The correct answer is: Context Switch

Question **10**

Correct

Mark 1.00 out of 1.00

Let the time taken to switch between user and kernel modes of execution be t_1 while the time taken to switch between two processes be t_2. Which of the following is TRUE?

Select one:

- $t_1 < t_2$ ✔
- $t_1 = t_2$
- $t_1 > t_2$
- No relation between t_1 and t_2

The correct answer is: $t_1 < t_2$

Question **11**

Not answered

Marked out of 1.00

In each of the following, you will be given a hypothetical sequence of states that a process enters during its lifetime. Which one is possible in a system with preemptive scheduling but not possible with non-preemptive scheduling?

Select one:

- New → Ready → Running → Terminated
- New → Ready → Running →Waiting → Ready → Running → Terminated
- New → Ready → Running → Waiting → Running → Terminated
- New → Ready → Running → Ready → Running → Terminated

The correct answer is: New → Ready → Running → Ready → Running → Terminated

Question **12**

Incorrect

Mark 0.00 out of 1.00

In which of the following scheduling policies does context switching never take place when all processes are CPU bound one?

Select one:

- Round – robin
- Non-preemptive Shortest job first ✖
- First come first served

The correct answer is: First come first served

Question **13**

Correct

Mark 1.00 out of 1.00

Aging is a technique used to _____

Select one:

- Increase the priority of processes that are currently running
- Decrease the priority of processes that are currently running
- Increase the priority of processes that are waiting for long time ✔
- Decrease the priority of processes waiting for long time

The correct answer is: Increase the priority of processes that are waiting for long time

Question **14**

Correct

Mark 1.00 out of 1.00

_____ are very effective because a mode switch is not required to switch from one thread to another.

Select one:

- Application level threads
- Alterable threads
- Kernel-level threads
- User-level threads ✔

The correct answer is: User-level threads

Question **15**

Correct

Mark 1.00 out of 1.00

A shared variable 'M' initialized to zero is operated on by four concurrent processes W, X, Y, Z as follows. Each of the processes W and X reads M from memory increments by one stores it to memory, and then terminates. Each of the processes Y and Z reads M from memory decrements by two, stores it to memory and then terminates. Each process before reading M invokes the P operation on a counting semaphore S and invokes the V operation on the semaphore S after storing M to memory. Semaphore S is initialized to two. What is the maximum possible value of M after all processes complete execution?

Select one:

- -2
- 2 ✔
- -1
- 1

The correct answer is: 2

Question **16**

Correct

Mark 1.00 out of 1.00

Three concurrent processes X, Y, and Z execute three different code segments that access and update certain shared variables. Process X executes the P operation (i.e., wait) on semaphores a, b and c; process Y executes the P operation on semaphores b, c and d; process Z executes the P operation on semaphores c, d, and a before entering the respective code segments. After completing the execution of its code segment, each process invokes the V operation (i.e., signal) on its three semaphores. All semaphores are binary semaphores initialized to one. Which one of the following represents a dead lock free order of invoking the P (wait) operations by the processes?

1. X : P (a) P(b) P(c) Y : P (b) P (c) P (d) Z : P (c) P(d) P(a)
2. X : P(b) P (a) P(c) Y : P(b) P (c) P(d) Z : P(a) P(c) P(d)
3. X : P(b)P (a) P(c) Y : P(c) P(b) P (d) Z : P(a) P(c) P(d)
4. X : P (a)P (b) P(c) Y : P(c) P (b) P(d) Z : P(c) P(d) P(a)

Select one:

- 3 only
- 1 and 3 only
- 1 and 4 only
- 2 only ✔

The correct answer is: 2 only

Question **17**

Correct

Mark 1.00 out of 1.00

Which of the following will be shared between all of the threads in a process? Assume a kernel-level thread implementation?

Select one:

- File descriptors ✔
- Scheduler priority
- Register values
- Local variables

The correct answer is: File descriptors

Question **18**

Correct

Mark 1.00 out of 1.00

Which of the following is an advantage of system level threads?

Select one:

- A thread blocking in the kernel doesn't stop all other threads in the same process
- Different threads can be scheduled on different processors in a multicore machine.
- Each thread can be scheduled separately, rather than using the time slice of one process over many
- All of the above ✔

The correct answer is: All of the above

Question **19**

Correct

Mark 1.00 out of 1.00

Let us consider a pre-emptive Shortest Job First scheduling where process A arrives at time 0 and needs to run for 1 hour. From the start time 0, other (short) processes will arrive every 1 minute and run for 2 minutes each. This situation will cause

Select one:

- Starvation for the short processes
- Starvation for process A ✔
- Priority Inversion
- Deadlock for all processes

The correct answer is: Starvation for process A

Question **20**

Not answered

Marked out of 1.00

Suppose we want to synchronize two concurrent processes P and Q using binary semaphores S and T. The code for the processes P and Q is shown below.

Process P:	Process Q:
while (1) {	while (1) {
W:	Y:
Print '0';	Print '1';
Print '0';	Print '1';
X:	Z:
}	}

Synchronization statements can be inserted only at points W, X, Y, and Z. Which of the following will always lead to an output starting with '001100110011'?

Select one:

- P(S) at W, V(T) at X, P(T) at Y, V(S) at Z, S initially 1, and T initially 0
- P(S) at W, V(T) at X, P(T) at Y, V(S) at Z, S and T initially 1
- P(S) at W, V(S) at X, P(T) at Y, V(T) at Z, S and T initially 1
- P(S) at W, V(S) at X, P(T) at Y, V(T) at Z, S initially 1, and T initially 0

The correct answer is: P(S) at W, V(T) at X, P(T) at Y, V(S) at Z, S initially 1, and T initially 0

Question **21**

Complete

Mark 11.00 out of 20.00

1. Give an example where a uniprogramming environment is appropriate.
2. What is the difference between multithreading and running multiple single-threaded processes?
3. Why does the operating system loader set the kernel mode before jumping to the entry point of the operating system?

For Questions 4 - 6

Suppose we have three processes.

Process ID	Required CPU time	Arrival Time
A	200 msec	50 msec
B	400 msec	150 msec
C	300 msec	0 msec

4. Draw the execution timeline for the FIFO scheduling policy, and compute the average response time, average wait time, and average turnaround time. Please show your work.
5. Assume the time slice of 100 msec and a zero context-switching cost. Draw the execution timeline for the round-robin scheduling policy, and compute the average response time, average wait time, and average turnaround time. Please show your work.
6. Draw the execution timeline for the SRTF scheduling policy, and compute the average response time, average wait time, and average turnaround time. Please show your work.
7. What is Race Condition? Given that we can create user-level code to control access to critical sections (e.g., Peterson's algorithm), why is it important for an operating system to provide synchronization facilities such as semaphores in the kernel?
8. Suppose each C statement is atomic in the following code. Create the execution order tree with all possible variable values. Thread A and B are running simultaneously. x and y are common for both threads. Write all possible order of execution and write the value of x and y in each possible order.

Thread A	**Thread B**
x=3;	y=2;
x=y-1;	y=x+1;

9. When a process is terminated, it enters a state called terminated. In this state, all the resources allocated to the process are reclaimed by the OS. Yet, the process may remain in terminated state for an extended period of time. Why is this so even when the process has no memory allocated to it?
10. The semaphore operation, "wait" and "signal", are denoted here with the classical notation of "P" and "V".

```
Process 1          Process 2          Process 3
L1:P(S3);          L2:P(S1);          L3:P(S2);
   print( "T" );      print( "U" );      print( "B" );
   V(S2);             V(S3);             V(S1);
   goto L1;           gotoL2             goto L3;
```

Suppose the initial values of the semaphores are S1=0, S2=0, S3=0. What are the possible output produced by these processes? (Write first 11 characters)

◄ Tutorial 1

Jump to...

Tutorial - Problems ►

Started on	Friday, 2 April 2021, 10:04 AM
State	Finished
Completed on	Friday, 2 April 2021, 10:54 AM
Time taken	50 mins
Marks	35.00/40.00
Grade	**8.75** out of 10.00 (**88**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Indirect message passing among processes requires a _____

Select one:

- monitor
- mailbox ✔
- semaphore
- shared variable

The correct answer is: mailbox

Question **2**

Incorrect

Mark 0.00 out of 1.00

A system has 4 processes and 5 allocatable resources. The current allocation and maximum needs tables and available vector are as follows:

	Allocated	Maximum	Available
P0	1 0 2 1 1	1 1 2 1 3	0 0 **X** 1 2
P1	2 0 1 1 0	2 2 2 1 0	
P2	1 1 0 1 0	2 1 3 1 0	
P3	1 1 1 1 0	1 1 2 2 1	

What is the smallest value of X for which this is a safe state?

Select one:

- 0
- 3
- 1
- 2 ✖

The correct answer is: 1

Question **3**

Correct

Mark 1.00 out of 1.00

In a system using fixed allocation 3 page frames are assigned to a program. Given a program refers to the following pages in sequence:

0,9,0,1,8,1,8,7,8,7,1,2,8,2,7,8,2,3,8,3

How many page faults will occur if the replacement policy used is **FIFO**

Answer: 8 ✔

The correct answer is: 8

Question **4**

Correct

Mark 1.00 out of 1.00

Page fault occurs when

Select one:

- one tries to divide a number by 0
- the page is corrupted by application software
- the page is in main memory
- the page is not in memory ✔

The correct answer is: the page is not in memory

Question **5**

Correct

Mark 1.00 out of 1.00

A shared variable 'M' initialized to zero is operated on by four concurrent processes W, X, Y, Z as follows. Each of the processes W and X reads M from memory increments by one stores it to memory, and then terminates. Each of the processes Y and Z reads M from memory decrements by two, stores it to memory and then terminates. Each process before reading M invokes the P operation on a counting semaphore S and invokes the V operation on the semaphore S after storing M to memory. Semaphore S is initialized to two. What is the maximum possible value of M after all processes complete execution?

Select one:

- -1
- -2
- 0
- 2 ✔

The correct answer is: 2

Question **6**

Correct

Mark 1.00 out of 1.00

_____ is a technique of temporarily removing inactive programs from the memory of computer system.

Select one:

- Swapping ✔
- Scheduler
- Spooling
- Semaphore

The correct answer is: Swapping

Question **7**

Correct

Mark 1.00 out of 1.00

Monitor is a language construct used to _____

Select one:

- control access to the critical section ✔
- observe the progress of a process execution
- aid the programmer to display the program output
- achieve spinlocks

The correct answer is: control access to the critical section

Question **8**

Incorrect

Mark 0.00 out of 1.00

A thread is usually defined as a 'light weight process' because an operating system (OS) maintains smaller data structures for a thread than for a process. In relation to this, which of the followings is TRUE?

Select one:

- On per-thread basis, the OS maintains only CPU register state
- The OS does not maintain a separate stack for each thread
- On per thread basis, the OS maintains only scheduling and accounting Information
- On per-thread basis, the OS does not maintain virtual memory state ✖

The correct answer is: On per-thread basis, the OS maintains only CPU register state

Question **9**

Correct

Mark 1.00 out of 1.00

Suppose two threads execute the following C code concurrently, accessing shared variables a, b, and c:

Initialization

int a = 4; int b = 0; int c = 0;

Thread 1	**Thread 2**
if (a < 0) {	b = 10;
c = b - a;	a = -3;
}	
else {	
c = b + a;	
}	

What are the possible values for c after both threads complete?

Select one:

- 4,7,14,13
- 0
- 4,7,14,13,-3 ✔
- Cannot say

The correct answer is: 4,7,14,13,-3

Question **10**

Correct

Mark 1.00 out of 1.00

The memory allocation scheme subject to "external" fragmentation is

Select one:

- segmentation ✔
- multiple contiguous fixed partitions
- swapping
- pure demand paging

The correct answer is: segmentation

Question **11**

Correct

Mark 1.00 out of 1.00

The enter_CS() and leave_CS() functions to implement critical section of a process are realized using test-and-set instruction as follows:

```
void enter_CS(X)        {
while test-and-set(X) ;
}
void leave_CS(X)    {
X=0;
}
```

In the above solution, X is a memory location associated with the CS and is initialized to 0. Now consider the following statements:

I. The above solution to CS problem is deadlock-free

II. The solution is starvation free.

III. The processes enter CS in FIFO order.

IV More than one process can enter CS at the same time.

Which of the above statements is TRUE?

Select one:

- II and III only
- IV Only
- I and II only
- I Only ✔

The correct answer is: I Only

Question **12**

Correct

Mark 1.00 out of 1.00

It is advantageous for the page size to be large because:

Select one:

- Page tables will be smaller ✔
- Large programs can be run
- Virtual addresses will be smaller.
- Less unreferenced data will be loaded into memory.

The correct answer is: Page tables will be smaller

Question **13**

Incorrect

Mark 0.00 out of 1.00

In a system using 4-bit for page number, part of the page table of a process is shown:

3	1011
4	0000
5	1110
6	0110

What are the physical addresses of the following logical address?

0101010110011011

Type in binary

Answer: 1011010110011011 ✖

The correct answer is: 1110010110011011

Question **14**

Correct

Mark 1.00 out of 1.00

A scheduling algorithm assigns priority proportional to the waiting time of a process. Every process starts with priority zero (the lowest priority). The scheduler re-evaluates the process priorities every T time units and decides the next process to schedule. Which one of the following is TRUE if the processes have no I/O operations and all arrive at time zero?

Select one:

- This algorithm is equivalent to the shortest-remaining-time-first algorithm
- This algorithm is equivalent to the shortest-job-first algorithm
- This algorithm is equivalent to the round-robin algorithm ✔
- This algorithm is equivalent to the first-come-first-serve algorithm

The correct answer is: This algorithm is equivalent to the round-robin algorithm

Question **15**

Correct

Mark 1.00 out of 1.00

Consider a system with m resources of same type being shared by n processes. Resources can be requested and released by processes only one at a time. The system is deadlock free if and only if

Select one:

- The sum of all max needs is < m-n
- The sum of all max needs is > m+n
- The sum of all max needs is = m+n
- The sum of all max needs is < m+n ✔

The correct answer is: The sum of all max needs is < m+n

Question **16**

Correct

Mark 1.00 out of 1.00

Suppose a page size of 2^{12} = 4,096 addressable bytes is being used by a memory management system. Also, 16 bit addresses are used for the virtual address space. Given virtual address: 20500, determine the page on which this address is found and its offset.

(Type Pageno and offset together (No separator) For Ex. if Page No. 10 and offset 100 then 10100

Answer: 520 ✔

The correct answer is: 520

Question **17**

Correct

Mark 1.00 out of 1.00

The term _____ refers to the continuous looping of a process executing an instruction or a set of instructions that tests the appropriate variable to gain entrance to a critical section.

Select one:

- indirect message passing
- direct message passing
- busy waiting ✔
- racing

The correct answer is: busy waiting

Question **18**

Correct

Mark 1.00 out of 1.00

Thrashing can be avoided if

Select one:

- the speed of CPU is increased
- the speed of I/O processor is increased
- the pages, belonging to the working set of the programs, are in main memory ✔
- priority inversion occurs

The correct answer is: the pages, belonging to the working set of the programs, are in main memory

Question **19**

Correct

Mark 1.00 out of 1.00

Suppose we want to synchronize two concurrent processes P and Q using binary semaphores S and T. The code for the processes P and Q is shown below.

Process P:	Process Q:
while (1) {	while (1) {
W:	Y:
Print '0';	Print '1';
Print '0';	Print '1';
X:	Z:
}	}

Synchronization statements can be inserted only at points W, X, Y, and Z. Which of the following will always lead to an output starting with '001100110011'?

Select one:

- P(S) at W, V(S) at X, P(T) at Y, V(T) at Z, S and T initially 1
- P(S) at W, V(T) at X, P(T) at Y, V(S) at Z, S and T initially 1
- P(S) at W, V(S) at X, P(T) at Y, V(T) at Z, S initially 1, and T initially 0
- P(S) at W, V(T) at X, P(T) at Y, V(S) at Z, S initially 1, and T initially 0 ✔

The correct answer is: P(S) at W, V(T) at X, P(T) at Y, V(S) at Z, S initially 1, and T initially 0

Question **20**

Correct

Mark 1.00 out of 1.00

Which of the following requires a device driver?

Select one:

- Main Memory
- Register
- Disk ✔
- Cache

The correct answer is: Disk

Question **21**

Correct

Mark 1.00 out of 1.00

In a multi-threaded process any of the threads making a blocking system call blocks the entire process when the _____ is used to describe the relationship between user threads and kernel threads.

Select one:

- the many-to-one model ✔
- the many-to-many model
- the one-to-many model
- the one-to-one model

The correct answer is: the many-to-one model

Question **22**

Correct

Mark 1.00 out of 1.00

A non-relocatable program is one which

Select one:

- cannot be made to execute in any area of storage other than the one designated for it at the time of its coding or translation. ✔
- can itself performs the relocation of its address-sensitive portions.
- can access OS.
- consists of a program and relevant information for its relocation.

The correct answer is: cannot be made to execute in any area of storage other than the one designated for it at the time of its coding or translation.

Question **23**

Correct

Mark 1.00 out of 1.00

Consider the following segment table:

Segment	Base	Length
0	219	600
1	2300	14
2	90	100
3	1327	580
4	1952	96

What is the physical addresses for the following logical address <3,400>

Select one:

- 1727 ✔
- illegal reference, trap to operating system
- 1000
- 1327

The correct answer is: 1727

Question **24**

Correct

Mark 1.00 out of 1.00

A system in which the output must be generated before the expiry of a deadline is called a _____.

Select one:

- soft real time system
- a hard real time system ✔
- a multiprogrammed system
- a time sharing system

The correct answer is: a hard real time system

Question **25**

Correct

Mark 1.00 out of 1.00

Three concurrent processes X, Y and Z execute three different code segments that access and update certain shared variable. Process X executes the P operation (i.e wait) on semaphores a, b and c, Process Y executes the P operation on semaphores b, c, and d, Process Z executes the P operation on semaphores c, d and a before entering the respective code segments. After completing the execution of its code segment, each process invokes the V operation (i.e. signal) on its three semaphores. All semaphores are binary semaphores initialized to one. Which one of the following represents a deadlock-free order of invoking the P operations by the processes?

Select one:

- X : P(b) P(a) P(c) Y: P(c) P(b) P(d) Z: P(a) P(c) P(d)
- X : P(a) P(b) P(c) Y: P(b) P(c) P(d) Z: P(c) P(d) P(a)
- X : P(a) P(b) P(c) Y: P(c) P(b) P(d) Z: P(c) P(d) P(a)
- X : P(b) P(a) P(c) Y: P(b) P(c) P(d) Z: P(a) P(c) P(d) ✔

The correct answer is: X : P(b) P(a) P(c) Y: P(b) P(c) P(d) Z: P(a) P(c) P(d)

Question **26**

Correct

Mark 1.00 out of 1.00

The principal of locality of reference justifies the use of

Select one:

- virtual memory
- non reusable
- reenterable
- cache memory ✔

The correct answer is: cache memory

Question **27**

Correct

Mark 1.00 out of 1.00

The typical page size may be

Select one:

- Usually between 10 and100 bytes
- More than 100 KB bytes but less than 1 MB
- Minimally 1 MB
- Usually of 512 to 2k bytes ✔

The correct answer is: Usually of 512 to 2k bytes

Question **28**

Correct

Mark 1.00 out of 1.00

Consider the methods used by processes P1 and P2 for accessing their critical sections whenever needed, as given below. The initial values of shared Boolean variables S1 and S2 are randomly assigned.

Method used by P1	**Method used by P2**
while (S1 = = S2) ;	while (S1 != S2) ;
Critica1 Section	Critica1 Section
S1 = S2;	S2 = not (S1);

Which one of the following statements describes the properties achieved?

Select one:

- Both mutual exclusion and progress
- Neither mutual exclusion nor progress
- Mutual exclusion but not progress ✔
- Progress but not mutual exclusion

The correct answer is: Mutual exclusion but not progress

Question **29**

Correct

Mark 1.00 out of 1.00

Page stealing

Select one:

- should be the tuning goal
- is taking page frames from other working sets ✔
- is a sign of an efficient system
- is taking larger disk spaces for pages paged out

The correct answer is: is taking page frames from other working sets

Question **30**

Correct

Mark 1.00 out of 1.00

Virtual memory is _____.

Select one:

- An illusion of extremely large main memory ✔
- An extremely large secondary memory
- A type of memory used in super computers.
- An extremely large main memory

The correct answer is: An illusion of extremely large main memory

Question **31**

Correct

Mark 1.00 out of 1.00

A process waiting to enter the critical section for a long time when other processes are going in and out of the critical section frequently is the indication of _____

Select one:

- a violation of the mutual exclusion requirement
- a livelock
- a deadlock
- a violation of the bounded waiting requirement ✔

The correct answer is: a violation of the bounded waiting requirement

Question **32**

Incorrect

Mark 0.00 out of 1.00

When a critical section is used for protecting shared variables, the variable can be accessed simultaneously by _____

Select one:

- multiple reader processes
- both reader and writer processes
- multiple writer processes
- only one process ✖

The correct answer is: multiple reader processes

Question **33**

Correct

Mark 1.00 out of 1.00

Let us consider a pre-emptive Shortest Job First scheduling where process A arrives at time 0 and needs to run for 1 hour. From the start time 0, other (short) processes will arrive every 1 minute and run for 2 minutes each. This situation will cause

Select one:

- Starvation for the short processes
- Starvation for process A ✔
- Deadlock for all processes
- Priority Inversion

The correct answer is: Starvation for process A

Question **34**

Correct

Mark 1.00 out of 1.00

Consider a paging system with the page table stored in memory. If a memory reference takes 200 nanoseconds, how long does a paged memory reference take?

Select one:

- 400 nanoseconds ✔
- 200 nanoseconds
- 600 nanoseconds
- can't say

The correct answer is: 400 nanoseconds

Question **35**

Correct

Mark 1.00 out of 1.00

Consider the two-dimensional array A:
int A[][] = new int[100][100];
where A[0][0] is at location 200, in a paged memory system with pages of size 200 bytes. A small process is in page 0 (locations 0 to 199) for manipulating the matrix; thus, every instruction fetch will be from page 0.
For two page frames, how many page faults are generated by the following array-initialization loop, using LRU replacement, and assuming page frame 1 has the process in it, and the other one is initially empty? Assume that the contents of the 2D matrix A are in row major order, which means that rows are stored in contiguous main memory locations and each integer in the matrix occupies a single memory location.

```
for (int i = 0; i < 100; i++)
        for (int j = 0; j < 100; j++)
                A[i][j] = 0;
```

Select one:

- 5000
- 50 ✔
- 10000
- 100

The correct answer is: 50

Question **36**

Incorrect

Mark 0.00 out of 1.00

A computer keeps its page tables in memory. The overhead required for reading a word from the page table is 1 ms. to reduce this overhead, the computer has TLB, which holds pairs (virtual page, physical page frame), and can do a lookup in 500 nanoseconds. What hit rate is needed to reduce the mean overhead to 750 nanoseconds for reading a word from page table?

Write in percentage without % symbol and 1 decimal point precision.

Answer: 0.9 ✖

The correct answer is: 99.9

Question **37**

Correct

Mark 1.00 out of 1.00

Consider a machine with 64MB physical memory and a 32-bit virtual address space. If the page size is 4 KB, what is the approximate size of the page table?

Select one:

- 8 MB
- 16MB
- 24 MB
- 2 MB ✔

The correct answer is: 2 MB

Question **38**

Correct

Mark 1.00 out of 1.00

The memory allocation scheme subject to "external" fragmentation is

Select one:

- segmentation ✔
- pure demand paging
- multiple contiguous fixed partitions
- swapping

The correct answer is: segmentation

Question **39**

Correct

Mark 1.00 out of 1.00

The process related to process control, file management, device management, information about system and communication that is requested by any higher level language can be performed by _____.

Select one:

- Caching
- Editors
- System Call ✔
- Compilers

The correct answer is: System Call

Question **40**

Correct

Mark 1.00 out of 1.00

Consider a system with m resources of same type being shared by n processes. Resources can be requested and released by processes only one at a time. The system is deadlock free if and only if

Select one:

- The sum of all max needs is = m+n
- The sum of all max needs is > m+n
- The sum of all max needs is < m+n ✔
- The sum of all max needs is < m-n

The correct answer is: The sum of all max needs is < m+n

◄ Tutorial 1

Jump to...

Tutorial 3 - 2021 ►

Started on	Friday, 16 April 2021, 1:30 PM
State	Finished
Completed on	Friday, 16 April 2021, 2:30 PM
Time taken	59 mins 48 secs
Marks	43.0/50.0
Grade	**34.4** out of 40.0 (**86**%)

Question **1**

Incorrect

Mark 0.0 out of 1.0

The time to read or write a 32-bit memory word is 10 nsec. Assume the total holes take one fifth of the 256 MB memory. What is the time needed to eliminate holes by compaction?

Select one:

- 268.435 msec
- 805.305 msec
- 1073.74 msec
- 536.87 msec ✖

The correct answer is: 1073.74 msec

Question **2**

Correct

Mark 1.0 out of 1.0

Where is the partition table stored?

Select one:

- Superblock
- Boot block
- Master Boot Record (MBR) ✔
- Bad sector

The correct answer is: Master Boot Record (MBR)

Question **3**

Correct

Mark 1.0 out of 1.0

Which of the following requires a device driver?

Select one:

- (●) Disk ✔
- ( ) Main Memory
- ( ) Cache
- ( ) Register

The correct answer is: Disk

Question **4**

Correct

Mark 1.0 out of 1.0

Consider a system with a disk of size 2^{30} bytes (1 gigabyte). Disk blocks are 2^{12} bytes in size. Assume the system uses Bitvector for free space management. Calculate the size of the bitvector required.

(Write the answer in KB. But donot specify the unit. For example if the answer is 100 KB, write only 100)

Answer: 32 ✔

The correct answer is: 32

Question **5**

Correct

Mark 1.0 out of 1.0

The operating system keeps the information of files in a table called

- ( ) File Index Table (FIT)
- ( ) File Folder Table (FFT)
- ( ) Directory Index Table (DIT)
- (●) File Allocation Table (FAT) ✔

The correct answer is:
File Allocation Table (FAT)

Question **6**

Correct

Mark 1.0 out of 1.0

A non-relocatable program is one which

- Can itself performs the relocation of its address-sensitive portions.
- Can access OS.
- Cannot be made to execute in any area of storage other than the one designated for it at the time of its coding or translation ✔
- Consists of a program and relevant information for its relocation.

The correct answer is:
Cannot be made to execute in any area of storage other than the one designated for it at the time of its coding or translation

Question **7**

Correct

Mark 1.0 out of 1.0

Page stealing

- is a sign of an efficient system
- is taking page frames from other working sets ✔
- is taking larger disk spaces for pages paged out
- should be the tuning goal

The correct answer is:
is taking page frames from other working sets

Question **8**

Incorrect

Mark 0.0 out of 0.5

The root directory of a partition in a Unix system is named "/".

Select one:

- True
- False ✖

The correct answer is 'True'.

Question **9**

Correct

Mark 1.0 out of 1.0

On a disk with 8 records per track, where the records are numbered from 0 to 7, and where the file is stored starting at track 0, record 14 is found on track

- 2
- 0
- 3
- 1 ✔

The correct answer is:
1

Question **10**

Correct

Mark 1.0 out of 1.0

Which is not a file attribute?

Select one:

- Size
- Type
- Shape ✔
- Name

The correct answer is: Shape

Question **11**

Correct

Mark 1.0 out of 1.0

It is advantageous for the page size to be large because:

- Less unreferenced data will be loaded into memory.
- Page tables will be smaller ✔
- Virtual addresses will be smaller.
- Large programs can be run.

The correct answer is:
Page tables will be smaller

Question **12**

Correct

Mark 1.0 out of 1.0

Increasing the RAM of a computer typically improves performance because:

- (•) Fewer page faults occur ✔
- ( ) Fewer segmentation faults occur
- ( ) Larger RAMs are faster
- ( ) Virtual memory increases

The correct answer is:
Fewer page faults occur

Question **13**

Correct

Mark 1.0 out of 1.0

What is the mounting of file system?

- ( ) removing the portion of the file system into a directory structure
- (•) attaching portion of the file system into a directory structure ✔
- ( ) creating of a file system
- ( ) deleting a file system

The correct answer is:
attaching portion of the file system into a directory structure

Question **14**

Correct

Mark 1.0 out of 1.0

Page fault occurs when

- ( ) one tries to divide a number by 0
- (•) the page is not in memory ✔
- ( ) the page is in main memory
- ( ) the page is corrupted by application software

The correct answer is:
the page is not in memory

Question **15**

Incorrect

Mark 0.0 out of 1.0

A system with a 32-bit virtual address. It uses the first 20 bits to indicate the page number. Each table entry takes 4 bytes. What is the size of the page table?

Select one:

- 1 MB
- 4 MB
- 3 MB
- 2 MB ✖

The correct answer is: 4 MB

Question **16**

Correct

Mark 1.0 out of 1.0

Where does the swap space reside?

- RAM
- ROM
- On-chip cache
- Disk ✔

The correct answer is:
Disk

Question **17**

Correct

Mark 1.0 out of 1.0

Working set model is:

Select one:

- Used to determine whether page replacement is needed
- Used for finding the minimum number of frames necessary for a job, so that jobs can run without "thrashing" ✔
- Used to find out the average number of frames a job will need in order to run smoothly without causing thrashing

The correct answer is: Used for finding the minimum number of frames necessary for a job, so that jobs can run without "thrashing"

Question **18**

Correct

Mark 1.0 out of 1.0

A file system uses 24-bit disk addresses with the block size 4 KB. What is the maximum partition size?

Select one:

- 64 GB ✔
- 32 GB
- 128 GB
- 256 GB

The correct answer is: 64 GB

Question **19**

Correct

Mark 1.0 out of 1.0

What is Address Binding?

- a mapping from one address space to another ✔
- locating an address with the help of another address
- binding two addresses together to form a new address in a different memory space
- going to an address in memory

The correct answer is:
a mapping from one address space to another

Question **20**

Correct

Mark 1.0 out of 1.0

The accuracy of the working set depends on the selection of ___

- number of pages in memory
- working set set ✔
- memory size
- working set model

The correct answer is:
working set set

Question **21**

Correct

Mark 1.0 out of 1.0

Which directory implementation is used in most Operating System?

- (●) Tree directory structure ✔
- ( ) Acyclic directory structure
- ( ) Single level directory structure
- ( ) Two level directory structure

The correct answer is:
Tree directory structure

Question **22**

Correct

Mark 1.0 out of 1.0

Which of the following statements is false?

- (●) Virtual memory reduces the context switching overhead ✔
- ( ) Virtual memory implements the translation of a program's address space into physical memory address space
- ( ) Virtual memory increases the degree of multiprogramming
- ( ) Virtual memory allows each program to exceed the size of the primary memory

The correct answer is:
Virtual memory reduces the context switching overhead

Question **23**

Correct

Mark 1.0 out of 1.0

If there are 32 segments, each size 1 k bytes, then the logical address should have

- (●) 15 bits ✔
- ( ) 14 bits
- ( ) 16 bits
- ( ) 13 bits

The correct answer is:
15 bits

Question **24**

Correct

Mark 1.0 out of 1.0

Consider the following segment table:

Segment	Base	Length
0	219	600
1	2300	14
2	90	100
3	1327	580
4	1952	96

What is the physical addresses for the following logical address <3,400>

- illegal reference, trap to operating system
- 1727 ✔
- 1327
- 1000

The correct answer is: 1727

Question **25**

Incorrect

Mark 0.0 out of 1.0

Consider a system with m resources of same type being shared by n processes. Resources can be requested and released by processes only one at a time. The system is deadlock free if and only if

- The sum of all max needs is < m+n
- The sum of all max needs is < m-n
- The sum of all max needs is > m+n ✖
- The sum of all max needs is = m+n

The correct answer is:
The sum of all max needs is < m+n

Question **26**

Correct

Mark 1.0 out of 1.0

Virtual memory is

- Large main memory
- stack memory
- Illusion of large main memory ✔
- Large secondary memory

The correct answer is:
Illusion of large main memory

Question **27**

Correct

Mark 1.0 out of 1.0

The UNIX system identifies a file as an executable binary file by

Select one:

- File descriptor
- File extension
- Magic number in the file header ✔
- File name

The correct answer is: Magic number in the file header

Question **28**

Correct

Mark 1.0 out of 1.0

If a process continues to fault, replacing pages, for which it then faults and brings back in right away. This high paging activity is called _____.

- paging
- thrashing ✔
- CPU utilization
- page fault

The correct answer is:
thrashing

Question **29**

Correct

Mark 1.0 out of 1.0

Suppose we have a file F1 with size 572 bytes. The capacity of the disk is 500 KB with fixed physical block size of 512 bytes for allocation. How many physical blocks would be needed to store this file using Contiguous, Linked and Indexed Allocation? Assume that in case of linked allocation strategy, 5 bytes are needed to store the next block in the link.

Select one:

- Contiguous - 2, Linked - 2, Index - 2
- Contiguous - 2, Linked - 2, Index - 3 ✔
- Contiguous - 1, Linked - 3, Index - 2
- Contiguous - 2, Linked - 3, Index - 3

The correct answer is: Contiguous - 2, Linked - 2, Index - 3

Question **30**

Correct

Mark 1.0 out of 1.0

Which is **not the operation** to be performed on directories?

Select one:

- Search for a file
- list a directory
- Truncate file ✔
- create a file

The correct answer is: Truncate file

Question **31**

Correct

Mark 1.0 out of 1.0

Which register holds the smallest legal physical memory address for a process?

- Base register ✔
- Limit register
- PCB
- Status register

The correct answer is:
Base register

Question **32**

Correct

Mark 1.0 out of 1.0

What is the swap space in the disk used for?

- Storing the super-block
- Saving temporary html pages
- Storing device drivers
- Saving process data ✔

The correct answer is:
Saving process data

Question **33**

Correct

Mark 1.0 out of 1.0

Which one of the following is the address generated by CPU?

- logical address ✔
- stack address
- physical address
- absolute address

The correct answer is:
logical address

Question **34**

Correct

Mark 1.0 out of 1.0

Which statement about hard and soft links is false?

Select one:

- Hard links can point to files in other disk partitions. ✔
- Symbolic links need space to store the name of the file pointed to.
- Hard links do not require any extra disk space.

The correct answer is: Hard links can point to files in other disk partitions.

Question **35**

Correct

Mark 1.0 out of 1.0

A computer system supports 32-bit virtual addresses as well as 32-bit physical addresses. Since the virtual address space is of the same size as the physical address space, the operating system designers decide to get rid of the virtual memory entirely. Which one of the following is true?

- CPU scheduling can be made more efficient now
- Efficient implementation of multi-user support is no longer possible
- The processor cache organization can be made more efficient now
- Hardware support for memory management is no longer needed ✔

The correct answer is:
Hardware support for memory management is no longer needed

Question **36**

Incorrect

Mark 0.0 out of 1.0

The optimal page replacement algorithm will select the page that

- Has been used least number of times.
- Will not be used for the longest time in the future.
- Has not been used for the longest time in the past. ✖
- Has been used most number of times.

The correct answer is:
Will not be used for the longest time in the future.

Question **37**

Incorrect

Mark 0.0 out of 1.0

When inverted paging is used, there is/are:

Select one:

- One global page table sorted by process id
- One global page table sorted by the frame number
- Page tables for each process sorted by the frame number ✖
- One global page table sorted by the virtual address

The correct answer is: One global page table sorted by the frame number

Question **38**

Correct

Mark 1.0 out of 1.0

Consider a virtual memory system with FIFO page replacement policy. For an arbitrary page access pattern, increasing the number of page frames in main memory will

Select one:

- never affect the number of page faults
- always increase the number of page faults
- sometimes increase the number of page faults ✔
- always decreases the number of page faults

The correct answer is: sometimes increase the number of page faults

Question **39**

Correct

Mark 1.0 out of 1.0

The dirty bit is used for the purpose of:

Select one:

- Implementing FIFO page replacement algorithm
- To avoid Thrashing
- Dynamic allocation of memory used by one process to another
- To reduce the average time required to service page faults ✔

The correct answer is: To reduce the average time required to service page faults

Question **40**

Correct

Mark 1.0 out of 1.0

Consider system with the following specification:

- Total available physical memory frame : 300
- Total processes : 6
- The frame needed by each process has the following format (Process ID, Total frame). List of needs :
  (0, 40), (1, 60), (2, 100), (3, 20), (4, 80), (5, 100)

Determine total frames given to **process 0**, if the system uses equal allocation mechanism.
Determine total frames given to **process 4**, if the system uses proportional allocation algorithm.

Select one:

- 50, 60 ✔
- 40, 80
- 40,60
- 50, 80

The correct answer is: 50, 60

Question **41**

Incorrect

Mark 0.0 out of 1.0

A computer keeps its page tables in memory. The overhead required for reading a word from the page table is 1 ms. to reduce this overhead, the computer has TLB, which holds pairs (virtual page, physical page frame), and can do a lookup in 500 nanoseconds. What hit rate is needed to reduce the mean overhead to 750 nanoseconds for reading a word from page table?

Write in percentage without % symbol and 1 decimal point precision.

Answer: 0.9 ✖

The correct answer is: 99.9

Question **42**

Correct

Mark 1.0 out of 1.0

Suppose a page size of 2^{12} = 4,096 addressable bytes is being used by a memory management system. Also, 16 bit addresses are used for the virtual address space. Given virtual address: 20500, determine the page on which this address is found and its offset.

(Type Pageno and offset together (No separator) For Ex. if Page No. 10 and offset 100 then 10100

Answer: 520 ✔

The correct answer is: 520

Question **43**

Correct

Mark 1.0 out of 1.0

On systems where there are multiple operating system, the decision to load a particular one is done by _____

Select one:

- process control block
- File control block
- boot loader ✔
- bootstrap

The correct answer is: boot loader

Question **44**

Correct

Mark 1.0 out of 1.0

In a system using 4-bit for page number, part of the page table of a process is shown:

3	1011
4	0000
5	1110
6	0110

What are the physical addresses of the following logical address?

0101010110011011

Type in binary

Answer: 1110010110011011 ✔

The correct answer is: 1110010110011011

Question **45**

Correct

Mark 0.5 out of 0.5

DMA is a mechanism for allowing an I/O device to transfer data to and from memory without involving the CPU in the transfer.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **46**

Correct

Mark 1.0 out of 1.0

Consider a paging system with the page table stored in memory. If a memory reference takes 200 nanoseconds, how long does a paged memory reference take?

- 400 nanoseconds ✔
- 600 nanoseconds
- Cannot be determined
- 200 nanoseconds

The correct answer is:
400 nanoseconds

Question **47**

Incorrect

Mark 0.0 out of 0.5

There is only one MBR (master boot record) on a disk drive, but there could be several boot sectors.

Select one:

- True
- False ✖

The correct answer is 'True'.

Question **48**

Correct

Mark 1.0 out of 1.0

Consider a virtual memory system with FIFO page replacement policy. For an arbitrary page access pattern, increasing the number of page frames in main memory will

- always decreases the number of page faults
- always increase the number of page faults
- sometimes increase the number of page faults ✔
- never affect the number of page faults

The correct answer is:
sometimes increase the number of page faults

Question **49**

Correct

Mark 1.0 out of 1.0

Each page is a power of -------- bytes long in paging scheme.

- 3
- 2 ✔
- 4
- 5

The correct answer is:
2

Question **50**

Correct

Mark 1.0 out of 1.0

The typical page size may be

a. Usually between 10 and100 bytes

b. More than 100 KB bytes but less than 1 MB

c. Minimally 1 MB

d. Usually of 512 to 2k bytes ✔

The correct answer is: Usually of 512 to 2k bytes

Question **51**

Correct

Mark 0.5 out of 0.5

A soft link can create a link between files across different file systems, whereas a hard link can only create links between a directory and a file within the same file system.

Select one:

True ✔

False

The correct answer is 'True'.

Question **52**

Correct

Mark 1.0 out of 1.0

In which case is Thrashing occurring?

Select one:

13% CPU and 97% disk utilization ✔

87% CPU and 3% disk utilization

13% CPU and 3% disk utilization

It will never occur

The correct answer is: 13% CPU and 97% disk utilization

Started on	Thursday, 29 April 2021, 8:16 PM
State	Finished
Completed on	Thursday, 29 April 2021, 8:17 PM
Time taken	17 secs
Marks	0.00/35.00
Grade	**0.00** out of 10.00 (**0**%)

Question **1**

Not answered

Marked out of 1.00

A soft link can create a link between files across different file systems, whereas a hard link can only create links between a directory and a file within the same file system.

Select one:

- True
- False

The correct answer is 'True'.

Question **2**

Not answered

Marked out of 1.00

There is only one MBR (master boot record) on a disk drive, but there could be several boot sectors.

Select one:

- True
- False

The correct answer is 'True'.

Question **3**

Not answered

Marked out of 1.00

It is possible for a system that uses a disk buffer cache with FIFO as the buffer replacement policy to suffer from the Belady's anomaly.

Select one:

- True
- False

The correct answer is 'True'.

Question **4**

Not answered

Marked out of 1.00

The dirty bit is used for the purpose of:

Select one:

- Implementing FIFO page replacement algorithm
- To reduce the average time required to service page faults
- Dynamic allocation of memory used by one process to another
- To avoid Thrashing

The correct answer is: To reduce the average time required to service page faults

Question **5**

Not answered

Marked out of 1.00

When inverted paging is used, there is/are:

Select one:

- Page tables for each process sorted by the frame number
- One global page table sorted by the virtual address
- One global page table sorted by the frame number
- One global page table sorted by process id

The correct answer is: One global page table sorted by the frame number

Question **6**

Not answered

Marked out of 1.00

Suppose we have a file F1 with size 572 bytes. The capacity of the disk is 500 KB with fixed physical block size of 512 bytes for allocation.
How many physical blocks would be needed to store this file using Contiguous, Linked and Indexed Allocation? Assume that in case of linked allocation strategy, 5 bytes are needed to store the next block in the link.

Select one:

- Contiguous - 1, Linked - 3, Index - 2
- Contiguous - 2, Linked - 2, Index - 3
- Contiguous - 2, Linked - 2, Index - 2
- Contiguous - 2, Linked - 3, Index - 3

The correct answer is: Contiguous - 2, Linked - 2, Index - 3

Question **7**

Not answered

Marked out of 1.00

Consider system with the following specification:

- Total available physical memory frame : 300
- Total processes : 6
- The frame needed by each process has the following format (Process ID, Total frame). List of needs : (0, 40), (1, 60), (2, 100), (3, 20), (4, 80), (5, 100)

Determine total frames given to **process 0**, if the system uses equal allocation mechanism.
Determine total frames given to **process 4**, if the system uses proportional allocation algorithm.

Select one:

- 40, 80
- 40,60
- 50, 60
- 50, 80

The correct answer is: 50, 60

Question **8**

Not answered

Marked out of 1.00

In which case is Thrashing occurring?

Select one:

- 13% CPU and 97% disk utilization
- 87% CPU and 3% disk utilization
- It will never occur
- 13% CPU and 3% disk utilization

The correct answer is: 13% CPU and 97% disk utilization

Question **9**

Not answered

Marked out of 1.00

Disk Scheduling Algorithms

Queue: 23, 89, 132, 42, 187

There are 200 cylinders numbered from 0 - 199

The disk head starts at number 100. Moving towards 0.

Using FCFS, SSTF, SCAN, LOOK, calculate the number of diskhead movements.

SSTF Choose...

SCAN Choose...

FCFS Choose...

LOOK Choose...

The correct answer is: SSTF → 273, SCAN → 287, FCFS → 423, LOOK → 241

Question **10**

Not answered

Marked out of 1.00

On systems where there are multiple operating system, the decision to load a particular one is done by _____

Select one:

- process control block
- boot loader
- File control block
- bootstrap

The correct answer is: boot loader

Question **11**

Not answered

Marked out of 1.00

Consider a system with a disk of size 2^{30} bytes (1 gigabyte). Disk blocks are 2^{12} bytes in size. Assume the system uses Bitvector for free space management. Calculate the size of the bitvector required.

(Write the answer in KB. But donot specify the unit. For example if the answer is 100 KB, write only 100)

Answer: ✖

The correct answer is: 32

Question **12**

Not answered

Marked out of 1.00

Working set model is:

Select one:

- Used to determine whether page replacement is needed
- Used to find out the average number of frames a job will need in order to run smoothly without causing thrashing
- Used for finding the minimum number of frames necessary for a job, so that jobs can run without "thrashing"

The correct answer is: Used for finding the minimum number of frames necessary for a job, so that jobs can run without "thrashing"

Question **13**

Not answered

Marked out of 1.00

DMA is a mechanism for allowing an I/O device to transfer data to and from memory without involving the CPU in the transfer.

Select one:

- True
- False

The correct answer is 'True'.

Question **14**

Not answered

Marked out of 1.00

Consider a file D1/F1 that is hard linked from another parent directory D2. Then the directory entry of this file (including the filename and inode number) in directory D1 must be exactly identical to the directory entry in directory D2.

Select one:

- True
- False

The correct answer is 'False'.

Question **15**

Not answered

Marked out of 1.00

In which of the four I/O software layers is computing the track, sector, and head for a disk read done.

Select one:

- Device-independent operating system software
- User-level I/O software
- Interrupt handlers
- Device drivers

The correct answer is: Device drivers

Question **16**

Not answered

Marked out of 1.00

Reading files via memory mapping them avoids an extra copy of file data from kernel space buffers to user space buffers.

Select one:

- True
- False

The correct answer is 'True'.

Question **17**

Not answered

Marked out of 1.00

Consider a virtual memory system with FIFO page replacement policy. For an arbitrary page access pattern, increasing the number of page frames in main memory will

Select one:

- always decreases the number of page faults
- sometimes increase the number of page faults
- never affect the number of page faults
- always increase the number of page faults

The correct answer is: sometimes increase the number of page faults

Question **18**

Not answered

Marked out of 1.00

Which file allocation method suffers from disk fragmentation (except for internal fragmentation in the last block)?

Select one:

- Contiguous allocation
- Linked list allocation
- Indexed Allocation
- I-nodes

The correct answer is: Contiguous allocation

Question **19**

Not answered

Marked out of 1.00

A file system checker found the file count is larger than the i-node count. What does this mean?

Select one:

- This problem is not serious
- A link to the file is not counted.
- The i-node points to some file that no longer exists
- File removed

The correct answer is: A link to the file is not counted.

Question **20**

Not answered

Marked out of 1.00

A system with a 32-bit virtual address. It uses the first 20 bits to indicate the page number. Each table entry takes 4 bytes. What is the size of the page table?

Select one:

- 4 MB
- 2 MB
- 3 MB
- 1 MB

The correct answer is: 4 MB

Question **21**

Not answered

Marked out of 1.00

One difficulty of contiguous allocation is _____

Select one:

- time taking
- costly
- finding space for a new file
- inefficient

The correct answer is: finding space for a new file

Question **22**

Not answered

Marked out of 1.00

Where is the partition table stored?

Select one:

- Master Boot Record (MBR)
- Superblock
- Bad sector
- Boot block

The correct answer is: Master Boot Record (MBR)

Question **23**

Not answered

Marked out of 1.00

Which of the following statements is/are true regarding memory-mapped I/O?

Select one:

- The CPU accesses the device memory much like it accesses main memory
- Memory-mapped I/O can be used only with an interrupt-driven device driver
- The CPU uses separate architecture-specific instructions to access memory in the device
- Memory-mapped I/O cannot be used with a polling-based device driver

The correct answer is: The CPU accesses the device memory much like it accesses main memory

Question **24**

Not answered

Marked out of 1.00

The root directory of a partition in a Unix system is named "/".

Select one:

- True
- False

The correct answer is 'True'.

Question **25**

Not answered

Marked out of 1.00

We describe a protocol of input device communication below.

1. Each device has a distinct address
2. The bus controller scans each device in sequence of increasing address value to determine if the entity wishes to communicate.
3. The device ready to communicate leaves it data in IO register.
4. The data is picked up and the controller moves to step above.

Identify the form of communication best describes the IO mode among the following:

Select one:

- Interrupt mode
- Polling
- Programmed mode of data transfer
- DMA

The correct answer is: Polling

Question **26**

Not answered

Marked out of 1.00

In contiguous allocation _____

Select one:

- each file must occupy a set of contiguous blocks on the disk
- each file is a linked list of disk blocks
- all the pointers to scattered blocks are placed together in one location

The correct answer is: each file must occupy a set of contiguous blocks on the disk

Question **27**

Not answered

Marked out of 1.00

Which statement about hard and soft links is false?

Select one:

- Hard links can point to files in other disk partitions.
- Symbolic links need space to store the name of the file pointed to.
- Hard links do not require any extra disk space.

The correct answer is: Hard links can point to files in other disk partitions.

Question **28**

Not answered

Marked out of 1.00

Thrashing can be avoided if

Select one:

- the speed of CPU is increased
- the pages, belonging to the working set of the programs, are in main memory
- the speed of I/O processor is increased
- priority inversion occurs

The correct answer is: the pages, belonging to the working set of the programs, are in main memory

Question **29**

Not answered

Marked out of 1.00

Which is **not the operation** to be performed on directories?

Select one:

- create a file
- Truncate file
- list a directory
- Search for a file

The correct answer is: Truncate file

Question **30**

Not answered

Marked out of 1.00

Which is not a file attribute?

Select one:

- Shape
- Type
- Name
- Size

The correct answer is: Shape

Question **31**

Not answered

Marked out of 1.00

A file system uses 24-bit disk addresses with the block size 4 KB. What is the maximum partition size?

Select one:

- 256 GB
- 32 GB
- 64 GB
- 128 GB

The correct answer is: 64 GB

Question **32**

Not answered

Marked out of 1.00

The UNIX system identifies a file as an executable binary file by

Select one:

- Magic number in the file header
- File extension
- File name
- File descriptor

The correct answer is: Magic number in the file header

Question **33**

Not answered

Marked out of 1.00

The time to read or write a 32-bit memory word is 10 nsec. Assume the total holes take one fifth of the 256 MB memory. What is the time needed to eliminate holes by compaction?

Select one:

- 268.435 msec
- 536.87 msec
- 1073.74 msec
- 805.305 msec

The correct answer is: 1073.74 msec

Question **34**

Not answered

Marked out of 1.00

Consider a disk system with 100 cylinders. The requests to access the cylinders occur in following sequence:
4, 34, 10, 7, 19, 73, 2, 15, 6, 20
Assuming that the head is currently at cylinder 50, what is the time taken to satisfy all requests if it takes 1ms to move from one cylinder to adjacent one and shortest seek time first policy is used?

Select one:

- 95 ms
- 276 ms
- 119 ms
- 233 ms

The correct answer is: 119 ms

Question **35**

Not answered

Marked out of 1.00

Which of the following requires a device driver?

Select one:

- Disk
- Cache
- Main Memory
- Register

The correct answer is: Disk

◄ Tutorial 2

Jump to...

Model CA Test ►

Started on	Saturday, 13 February 2021, 9:05 AM
State	Finished
Completed on	Saturday, 13 February 2021, 9:45 AM
Time taken	40 mins
Grade	**15.00** out of 15.00 (**100**%)

Question **1**

Complete

Mark 1.00 out of 1.00

Which of the following instructions should be privileged?
a. Set value of timer.
b. Read the clock.
c. Clear memory.
d. Issue a trap instruction.
e. Turn off interrupts.
f. Modify entries in device-status table.
g. Switch from user to kernel mode.
h. Access I/O device.

a,c,e,f,g,h

Question **2**

Complete

Mark 1.00 out of 1.00

How does the distinction between kernel mode and user mode function as a rudimentary form of protection (security) system?

Important functions like execution of privileged instructions, Controlling interrupts, accessing hardware devices can be done only when CPU is in kernel mode. Thereby, CPU has very limited functioning in user mode such as running applications, etc. Thus, this differentiation acts as a rudimentary form of protection

Question **3**

Complete

Mark 1.00 out of 1.00

Differentiate trap and interrupt.

Interrupts are hardware-generated while trap is a software-generated interrupt. The main purpose of the interrupt is to bring attention to the CPU to some high priority events that have to be executed immediately. The purpose of trap is to bring attention to the CPU to execute system calls that are required in the execution of the user code such as calling operating system routines or to catch arithmetic errors.

Question **4**

Complete

Mark 1.00 out of 1.00

Including the initial parent process, how many processes are created by the program shown below.

```
#include <stdio.h>
#include <unistd.h>
int main()
{
    /* fork a child process */
    fork();
    /* fork another child process */
     fork();
     /* and fork another */
     fork();
     return 0;
}
```

8

Question **5**

Correct

Mark 1.00 out of 1.00

The objective of multi programming is

1. to have some process running at all times
2. single process should run at a time
3. to maximize CPU utilization
4. to minimize CPU utilization

Select one:

- 1 & 3 ✔
- 1 & 4
- 2 & 3
- 1

The correct answer is: 1 & 3

Question **6**

Correct

Mark 1.00 out of 1.00

Once the process is allocated the CPU and is executing, which of several events could occur:

1. The process could issue an I/O request and then be placed in an I/O queue.
2. The process could create a new child process and wait for the child's termination.
3. The process could be removed forcibly from the CPU, as a result of an interrupt, and be put back in the ready queue.

Select one:

- 1 & 2
- 1, 2 & 3 ✔
- 2 & 3
- Only 1

The correct answer is: 1, 2 & 3

Question **7**

Correct

Mark 1.00 out of 1.00

Which of the following is TRUE for an I/O-bound process.

1. It is one that spends more of its time doing I/O.

2. It is one that spends more of its time doing computations.

3. If all processes are I/O-bound, then the ready queue will almost always be empty

4. If all processes are I/O-bound, then the ready queue will almost always be full.

Select one:

- 2 & 3
- 1 & 3 ✔
- 1 only
- 2 & 4

The correct answer is: 1 & 3

Question **8**

Correct

Mark 1.00 out of 1.00

Both processes (the parent and the child) continue execution at the instruction after the fork(), with one difference: the return code for the fork() is _____ for the new child, whereas the _____ process identifier of the child is returned to the parent. If fork fails (new process couldn't be created maybe due to non-availability of memory), the fork() returns _____ to process that executed fork.

Select one:

- Negative Integer, Zero, Zero
- Zero, Non-zero Integer, Negative Integer ✔
- Non-zero Integer, Zero, Negative Integer
- Zero, Negative Integer, Zero

The correct answer is: Zero, Non-zero Integer, Negative Integer

Question **9**

Correct

Mark 1.00 out of 1.00

When a child process is terminated, the kernel keeps some information about it in the process table (like ID, parent, including its exit status). The parent needs to read the exit status of the child before it removes the child's entry from the table. A child process must always become a _____ until its status is collected by its parent.

Select one:

- Terminal Process
- Orphan process
- Zombie process ✔

The correct answer is: Zombie process

Question **10**

Correct

Mark 1.00 out of 1.00

Using Priority Scheduling algorithm, find the average waiting time for the following set of processes given with their priorities in the order: Process : Burst Time : Priority respectively . P1 : 10 : 3 , P2 : 1 : 1 , P3 : 2 : 4 , P4 : 1 : 5 , P5 : 5 : 2.

- 3 milliseconds
- 8 milliseconds
- 7.75 milliseconds
- 8.2 milliseconds ✔

The correct answer is:
8.2 milliseconds

Question **11**

Correct

Mark 1.00 out of 1.00

Let the time taken to switch between user and kernel modes of execution be t_1 while the time taken to switch between two processes be t_2. Which of the following is TRUE?

- $t_1 = t_2$
- No relation between t_1 and t_2
- $t_1 > t_2$
- $t_1 < t_2$ ✔

The correct answer is:
$t_1 < t_2$

Question **12**

Correct

Mark 1.00 out of 1.00

In each of the following, you will be given a hypothetical sequence of states that a process enters during its lifetime. Which one is possible in a system with preemptive scheduling but not possible with non-preemptive scheduling?

- New -> Ready -> Running -> Ready -> Running -> Terminated ✔
- New -> Ready -> Running -> Terminated
- New -> Ready -> Running -> Waiting -> Ready -> Running -> Terminated
- New -> Ready -> Running -> Waiting -> Terminated

The correct answer is:
New -> Ready -> Running -> Ready -> Running -> Terminated

Question **13**

Correct

Mark 1.00 out of 1.00

In process scheduling, ... determines which new processes are admitted to the system.

- short term scheduling
- long term scheduling ✔
- CPU scheduling
- medium term scheduling

The correct answer is:
long term scheduling

Question **14**

Correct

Mark 1.00 out of 1.00

With the round robin CPU scheduling in a time-shared system _____.

- Using extremely small time slices degenerate in to last in first out algorithm
- Using very large time slice degenerates in to first come first served algorithm ✔
- Using extremely small time slices improve performance
- Using medium sized time slices leads to shortest request time first algorithm

The correct answer is:
Using very large time slice degenerates in to first come first served algorithm

Question **15**

Correct

Mark 1.00 out of 1.00

Suppose that a process is in “Blocked” state waiting for some I/O service. When the service is completed, it goes to the _____

- Ready state ✔
- Running state
- Exit state
- Zombie state

The correct answer is:
Ready state

◄ Announcements

Jump to...

CA TEST 1 ►

Started on	Thursday, 18 February 2021, 5:05 PM
State	Finished
Completed on	Thursday, 18 February 2021, 6:30 PM
Time taken	1 hour 24 mins
Grade	**38.50** out of 40.00 (**96**%)

Question **1**

Complete

Mark 2.00 out of 2.00

How does the mixture of I/O bound process with CPU bound process maximizes system utilization?

i/O bound processes spend a lot of time on i/o than doing computations .
Cpu has few i/o request and more computations.

thus, mixture of i/o and cpu bound processes will ensure maximum cpu utilization and high thoroughput

Question **2**

Complete

Mark 2.00 out of 2.00

Write about Preemptive vs Non-preemptive Scheduling. Can we have preemptive kernels? (i,e whether a process can be preempted while it is executing in kernel mode). If yes, what problems could arise?

When a process switches from the running state to the ready state and When a process switches from the waiting state to the ready state ,it is preemptive scheduling.
When a process switches from the running state to the waiting state and When a process terminates, it is non preemptive scheduling.
when a process is preempted in kernel mode, there will be chaos.
the kernel may be busy with an activity on behalf of a process.
Such activities may involve changing important kernel data hence, affecting the design of the operating system kernel

Question **3**

Complete

Mark 2.00 out of 2.00

What is the difference between a process starting another copy of itself and starting another thread? Which do you feel has more advantage? Why?

A process is an execution of a program but a thread is a single execution sequence within the process. A process can contain multiple threads. A thread is sometimes called a lightweight process.

Threads are more advantageous because :
1.Creation of thread quicker than a process.
2.Much quicker to switch between threads than to switch between processes.
3.Threads share data easily

thus, its threads because process creation is time consuming and resource intensive

Question **4**

Complete

Mark 2.00 out of 2.00

Monolithic kernel and Micro kernel, which do you feel is better? Why?

Micro kernel is better because,
1. In monolithic kernel, if one of the processes crash the entire system will crash wherein in micro kernel a single process crash will not affect the other processes
2.microkernel is secure
3.micro kernel is easy to maintain and debug
4.micro kernel provides more flexibility, extensibility, portability and reliability.

Question **5**

Complete

Mark 2.00 out of 2.00

Describe how the multilevel feedback queue scheduling handles the potential starvation problem in the multilevel queue scheduling.

It partitions ready queue into several separate queues and Processes are permanently assigned to one queue based on some property of the process such as memory size, priority and process time.

Each queue has its own scheduling algorithm

The idea is to separate processes with different CPU-burst characteristics. If a process uses too much CPU time, it will be moved to a lower-priority queue. Similarly, a process that waits too long in a lower-priority queue may be moved to a higher-priority queue.

This form of aging prevents starvation.

Question **6**

Complete

Mark 1.50 out of 2.00

You write a UNIX shell, but instead of calling fork() then exec() to launch a new job, you instead insert a subtle difference: the code first calls exec() and then calls fork() like the following:

```
shell (..) {
.. ..
exec (cmd, args);
fork();
.. ..
}
```

Does it work? What is the impact of this change to the shell, if any?

No, it doesn't work

Shell's address space is entirely replaced with the new command(cmd), therefore the shell will terminate once cmd is terminated.

Question **7**

Complete

Mark 2.00 out of 2.00

Now you want to implement a web-server for Facebook, to serve each user's "Home" page (the first page you see after you log in).

This time your web-server needs to perform many tasks: load the news feeds from each of your friends, load the advertisement, check for new messages, etc.

Now you want to implement your web-server by using multi-threading, and have one thread to perform each of the tasks, and later these threads will cooperate with each other to collectively construct the "Home" page.

For performance reasons, Facebook makes sure that all the data these threads need is already cached in the memory (so they don't have to perform any disk I/O).

Do you think user-level threads or kernel-level threads should be used? Why?

User-level thread.

Here since the concern of user-level thread, namely "one thread can block all other threads within the same process", no longer exists (as threads won't make blocking I/O calls), so we can use user-level thread for its efficiency.

This is beneficial since these threads needs to communicate frequently with each other.
If kernel-thread is used, everytime such communication needs to go through the kernel, which is more expensive.

Question **8**

Complete

Mark 2.00 out of 2.00

Suppose that a scheduling algorithm (at the level of short-term CPU scheduling) favors those processes that have used the least processor time in the recent past.

Why will this algorithm favor I/O-bound processes and yet not permanently starve CPU-bound processes?

I/O bound programs will be favored due to the CPU burst request of the I/O programs since they have shorter CPU burst request . Hence, CPU-bound programs will not be permanently starved as the CPU resources will be released soon to the CPU-bound programs for use.

Question **9**

Complete

Mark 2.00 out of 2.00

The following state transition table is a simplified model of process management, with the labels representing transitions between states of READY, RUN, BLOCKED and NONRESIDENT(SUSPENDED).

	READY	RUN	BLOCKED	NONRESIDENT
READY	–	1	–	5
RUN	2	–	3	–
BLOCKED	4	–	–	6

Give an example of an event that can cause each of the above numbered transitions.

1.when dispatcher selects a process to run
2.running process has ran past its time or more higher priority process has come through
3.when process request I/o service or other requests
4.when the event that made the process to wait has been completed
5.to free large block of main memory or blocked process may be high priority process than ready process
6.If there are no ready processes, then at least one blocked process is swapped out to secondary storage to make space for another process which is not blocked.

Question **10**

Complete

Mark 1.00 out of 2.00

Under what circumstances can a multi-threaded (Kernel level/User level threads) program complete more quickly than a non-multi-threaded program? Keep in mind that multi-threading has thread context-switch overhead associated with it.

Some operating system provide a combined user level thread and Kernel level thread facility.
In a combined system, multiple threads within the same application can run in parallel on multiple processors and a blocking system call need not block the entire process
In such situations, they are quicker than a non multi threaded program

Question **11**

Correct

Mark 1.00 out of 1.00

Consider the following statements with respect to user-level threads and kernel supported threads
i. context switch is faster with kernel-supported threads
ii. for user-level threads, a system call can block the entire process
iii. Kernel supported threads can be scheduled independently
iv. User level threads are transparent to the kernel

Which of the above statements are true?

- (i) and (ii) only
- (i) and (iii) only
- (ii) and (iii) only
- (ii), (iii) and (iv) only ✔

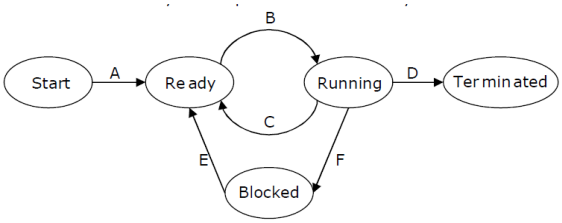
The correct answer is:
(ii), (iii) and (iv) only

Question **12**

Correct

Mark 1.00 out of 1.00

In the following process state transition diagram for a uni-processor system, assume that there are always some processes in the ready state:



Now consider the following statements:

I. If a process makes a transition D, it would result in another process making transition A immediately.
II. A process P2 in blocked state can make transition E while another process P1 is in running state.
III. The OS uses preemptive scheduling.
IV. The OS uses non-preemptive scheduling.
Which of the above statements are TRUE?

- I and II
- II and IV
- I and III
- II and III ✔

The correct answer is:
II and III

Question **13**

Correct

Mark 1.00 out of 1.00

_____ scheduling is approximated by predicting the next CPU burst with an exponential average of the measured lengths of previous CPU bursts.

- FCFS
- Multi-level queue
- SJF ✔
- RR

The correct answer is:
SJF

Question **14**

Correct

Mark 1.00 out of 1.00

Which component of a process is not shared across threads?

- Register values ✔
- Heap memory
- Program memory
- Global variables

The correct answer is:
Register values

Question **15**

Correct

Mark 1.00 out of 1.00

A process control block (PCB) exists only for processes in

- the ready state
- ready and running states
- ready and blocked states
- ready, running, and blocked states ✔

The correct answer is:
ready, running, and blocked states

Question **16**

Correct

Mark 1.00 out of 1.00

Process aging:

- increases the runtime of a process
- improves the chances of a process getting scheduled to run ✔
- helps estimate the length of the next compute period
- is a count of the total CPU time used by the process and is stored in the PCB

The correct answer is:
improves the chances of a process getting scheduled to run

Question **17**

Correct

Mark 1.00 out of 1.00

What is normally meant by a “context switch”?

- Saving the state of one process and restoring the state of another process so that the CPU moves from running one process to running the other ✔
- The change which occurs on the stack of a running process as it makes a function call, including the allocation of memory for any parameters and the local variables
- Any change in state of a process as it executes
- The switch between a process running in user mode to running in kernel mode. This can happen as the result of a system call or an exception

The correct answer is:
Saving the state of one process and restoring the state of another process so that the CPU moves from running one process to running the other

Question **18**

Correct

Mark 1.00 out of 1.00

Which of the following is true about shell?

- A Shell provides us with an interface to the Unix/Linux system
- Shell is a command-line interpreter that gathers input from us and executes programs based on that input
- Shell is an environment in which we can run our commands, programs, and shell scripts
- All of the above ✔

The correct answer is:
All of the above

Question **19**
Correct
Mark 1.00 out of 1.00

In Unix OS, _____ is the first process created after booting with Process id(Pid) ____

- systemd;1
- init;1 ✔
- init;0
- systemd;0

The correct answer is:
init;1

Question **20**
Correct
Mark 1.00 out of 1.00

_____ process is responsible for managing clients that connect to the system by remote login.

- init
- sshd ✔
- logind
- systemd

The correct answer is:
sshd

Question **21**
Correct
Mark 1.00 out of 1.00

Multiple processes can correspond to the same program / executable file at the same time.

Select one:
- True ✔
- False

The correct answer is 'True'.

Question **22**

Correct

Mark 1.00 out of 1.00

It is necessary for threads in a process to have separate stacks.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **23**

Correct

Mark 1.00 out of 1.00

A process makes a system call to read a packet from the network device, and blocks. The scheduler then context-switches this process out. This is an example of a voluntary context switch.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **24**

Correct

Mark 1.00 out of 1.00

Threads in a process share the same file descriptors

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **25**

Correct

Mark 1.00 out of 1.00

Consider two machines A and B of different architectures, running two different operating systems OS-A and OS-B. Both operating systems are ***Portable Operating System Interface (POSIX)*** compliant. The source code of an application that is written to run on machine A must always be rewritten to run on machine B.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **26**

Correct

Mark 1.00 out of 1.00

The pthreads library used by Unix and Linux systems supports both user-level threads and kernel level threads.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **27**

Correct

Mark 1.00 out of 1.00

GRUB (GRand Unified Bootloader) is a boot loader package that supports multiple operating systems on a computer. During boot-up, the user can select the operating system to run.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **28**

Correct

Mark 1.00 out of 1.00

Traps are due to some sort of event that is external to and independent of the currently running process, such as the completion of an I/O operation.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **29**

Correct

Mark 1.00 out of 1.00

Process switch, which involves a state change, requires more effort, than a mode switch.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **30**

Correct

Mark 1.00 out of 1.00

Process is a program in execution that also includes current activity as represented by the value of the program counter, process-id and the contents of the CPU registers.

Select one:

- True ✔
- False

The correct answer is 'True'.

◄ OS Tutorial 1

Jump to...

CA Test2 ►

Started on	Friday, 16 April 2021, 1:30 PM
State	Finished
Completed on	Friday, 16 April 2021, 2:45 PM
Time taken	1 hour 14 mins
Grade	**37.0** out of 40.0 (**93**%)

Question **1**

Complete

Mark 3.0 out of 3.0

A system uses paging to implement logical memory. Specifically, it uses a simple linear page table. The logical address space is of size 1 GB (30 bits); the page size is 1 KB; each page table entry holds only a validity bit and the resulting frame number; the system has a maximum of 2^{15} physical pages (32 MB of physical memory can be addressed at most). How much memory is used for page tables, when there are 100 processes running in the system?

A entry in the page table consists of a the corresponding frame number and a validity bit.

Since the number of pages that can be present in the main memory is 2^15, we need 15 bits for the frame number to address all possible frames. So an entry will require 15 bits for frame number and 1 for validity bit resulting in total of 16 bits(2 bytes).

Now the considering that the page table has entries for all address that it can have, we end up with 2^20 entries. So one process table will have 2^20*2=2^21 bytes.

Now each process has its own copy of the page table, so 100 process will result in 100 page tables. So, Total memory for page tables = 100 *2^21 = 25* 2^2 *2^21 bytes = 25* 2^23 bytes

Question **2**

Complete

Mark 3.0 out of 3.0

Consider a system where the virtual memory page size is 2K (2048 bytes), and main memory consists of 4 page frames. Now consider a process which requires 8 pages of storage. At some point during its execution, the page table is as shown below:

Virtual page	Valid	Physical page
0	No	
1	No	
2	Yes	1
3	No	
4	Yes	3
5	No	
6	Yes	0
7	Yes	2

· List at least one virtual address that will result in a page fault.

· Give the main memory (physical) addresses for each of the following virtual addresses (all numbers decimal): (i) 8500, (ii) 14000, (iii) 5000, (iv) 2100.

Page number 0, 1, 3 and 5 have Virtual Memory Address that will produce page faults .

Virtual memory address 0 will try to reference the first block(byte) in page 0, but it is invalid.

Page size = 2KB.So, we need 11 bits for the offset.

1) 8500
Page number floor(8500/2048) = 4
Page Offset 8500 % 2048= 308 ,Corresponding Frame number for Page 4 is 3.
So Actual Address 3*2048+ 308=6452

2) 14000
Page Number floor(14000/2048) = 6
Page Offset 14000 % 2048=1712,
Frame number for Page 6 : 0.
Actual Address 0*2048 + 1712 = 1712

3)5000
Page Number floor(5000/2048) = 2
Page Offset: 5000% 2048 =904
Actual Address : 1 *2048 + 904 = 2952
Corresponding Frame number for page 2 is 1.

iv) 2100
Page Number floor(2100/2048) = 1
Page Offset :2100 % 2048 = 52
Here, actual address may change depending upon which page gets replaced out because corresponding Frame Number for the page is not available.

Question **3**

Complete

Mark 3.0 out of 3.0

Consider the following snapshot of a system (P=Process, R=Resource) :

Available			
RA	RB	RC	RD
8	5	9	7

Maximum Demand					Current Allocation				
	RA	RB	RC	RD		RA	RB	RC	RD
P0	3	2	1	4	P0	1	0	1	1
P1	0	2	5	2	P1	0	1	2	1
P2	5	1	0	5	P2	4	0	0	3
P3	1	5	3	0	P3	1	2	1	0
P4	3	0	3	3	P4	1	0	3	0

Answer the following questions using banker's algorithm:

- Calculate the *Needs* matrix:
- Is the system in a safe state? If so, show a safe order in which the processes can run.
- Can a request of one instance of RA by Process P0 be granted safely according to Banker's algorithm?

NEED MATRIX :

	RA	RB	RC	RD
P0	2	2	0	3
P1	0	1	3	1
P2	1	1	0	2
P3	0	3	2	0
P4	2	0	0	3

AVAILABLE :

1.(8,5,9,7)
2. P0 : (9,5,10,8)
3. P1 : (9,6,12,9)
4. P2:(13,6,12,12)
5. P3:(14,8,13,12)
6. P4:(15,8,16,12)

SAFE STATE : Yes, the system is in safe state when processes are executed in safe sequence of p0->p1->p2->p3->p4

YES ,One instance of RA by process P0 can be granted safely.

Question **4**

Complete

Mark 1.0 out of 3.0

What do you mean by locality of reference? A student in a compiler course suggests to the professor a project of writing a compiler that will produce a list of page references that can be used to implement the optimal page replacement algorithm. Is this possible? Why or why not?

Locality of reference: A locality is a set of pages that are actively used together

The optimal page replacement algorithm is an algorithm that works as follows: when a page needs to be swapped in, the operating system swaps out the page whose next use will occur farthest in the future. Say a page that is not going to be used for the next 6 seconds will be swapped out over a page that is going to be used within the next 0.4 seconds.

This algorithm cannot be implemented in a general purpose operating system because it is impossible to compute reliably how long it will be before a page is going to be used, except when all software that will run on a system is either known beforehand

Despite this limitation, algorithms exist that can offer near-optimal performance — the operating system keeps track of all pages referenced by the program, and it uses those data to decide which pages to swap in and out on subsequent runs. This algorithm can offer near-optimal performance, but not on the first run of a program, and only if the program's memory reference pattern is relatively consistent each time it runs.

Question **5**

Complete

Mark 3.0 out of 3.0

Suppose a thread is running in a critical section of code with some shared resources locked for its usage from other processes, can it get context switched? Why or why not?

Yes, a process holding a lock can get context switched. Locks (especially user-level locks) are independent of the scheduler.
Threads running in the kernel with interrupts disabled would not get context-switched).

Here, grabbing a lock is different from disabling interrupts(and thus preventing context switching)

Acquisition of the lock prevents other threads from running in the same critical section at the same time

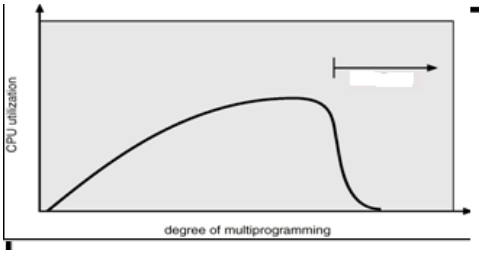
It does not generically prevent other threads from running

Question **6**

Complete

Mark 3.0 out of 3.0

Consider the graph given below that shows a plot of “degree of multiprogramming” on X-axis versus “CPU utilization” on Y-axis. What is the phenomenon observed by a sudden dip in the graph called? How can it be prevented?



The phenomenon is called thrashing ,Its a condition or a situation when the system is spending a major portion of its time in servicing the page faults, but the actual processing done is very negligible.

Steps to prevent Thrashing:

1.Working Set Strategy:

By providing a process with as many frames as it needs. The working-set strategy starts by looking at how many frames a process is actually using. The basic principle states that if we allocate enough frames to a process to accommodate its current locality, it will only fault whenever it moves to some new locality. But if the allocated frames are lesser than the size of the current locality, the process is bound to thrash.

2.Page Fault Frequency:

The problem associated with Thrashing is the high page fault rate and thus, the concept here is to control the page fault rate. If the page fault rate is too high, it indicates that the process has too few frames allocated to it. On the contrary, a low page fault rate indicates that the process has too many frames.

Question **7**

Complete

Mark 3.0 out of 3.0

Why are Translation Look-aside Buffers (TLBs) important? In a simple paging system, what information is stored in a typical TLB table entry?

1. The two-memory access problem can be solved by the use of a special fast-lookup hardware cache called associative memory or translation look-aside buffers (TLBs). A set of associative registers is built of high-speed memory where each register consists of two parts: a key and a value. When the associative registers are presented with an item, it is compared with all keys simultaneously. If the item is found, the corresponding value field is the output.

2. A translation lookaside buffer is a memory cache that is used to reduce the time taken to access a user memory location. It is a part of the chip's memory management Unit

3. TLB contains page table table entries that are recently accessed. It is important because it helps to avoid wasting time going to the disk to retrieve a page table entry. A typical TLB entry consists of page number and frame number, when a logical address is generated by the CPU.

4. Each entry in the TLB consists of 2 parts, a key and a value which is a frame number and when there is a request for an item, it is compared with al keys simultaneously and if a match is found then the fame number is returned. If no match is found then the page table is referenced for frame number.

Question **8**

Complete

Mark 2.0 out of 3.0

If a large number of programs is kept in main memory, then there is almost always another ready program when a page fault occurs. Thus, CPU utilization is kept high. If, however, we allocate a large memory space to each of a few programs, then each program produces a smaller number of page faults. Thus, CPU utilization is kept high.

Are these two arguments correct? Which policy, if either, should be preferred? Why?

Both arguments are correct to a point, and neither should be preferred because each doesnot address the issue of thrashing.
The degree of multi programmig should be adjusted to ensure that each process can obtain its working set of page frames

Question **9**

Complete

Mark 3.0 out of 3.0

Suppose a program has three threads Thread1, Thread2, and Thread3, and a shared counter variable, count, as shown below:

int count = 10;

Semaphore Lock = 1; // initial value is 1

Thread1	Thread2	Thread3
// do something	// do something	// do something
wait(Lock);	wait(Lock);	wait(Lock);
count++;	count−−;	printf("%d", count);
Signal(Lock);	Signal(Lock);	Signal(Lock);

What are the possible outputs of this program? If there is more than one answer, provide them all. Does this process suffer from a race condition? Justify your answer.

i)

Possible outputs : 9, 10, 11

ii)

A race condition is when it is possible to observe the order in which events in different processes occur, and that order is not constrained by synchronization.

A race condition does exist here because the output can be different for different orderings of the program. The race condition is nothing but when it is possible to observe the order in which events in different process occur, and that order is not constrained by synchronization.

Question **10**

Complete

Mark 3.0 out of 3.0

Consider a computer is equipped with associative memory that can hold 16 entries of the page table and can be accessed in 10 nanoseconds. The hit ratio is the percentage of the page table entry can be found in the associative memory. The CPU takes total 130 nanoseconds to search the page entry and access a data item when the page entry is not in the associative memory.

- Find a formula that expresses the effective access time as a function of the hit ratio
- What hit ratio is needed to achieve the effective access time to 82 nanoseconds?

Hit ratio = a

Main Memory access time = m

Associative Lookup (TLB access) = e

FORMULA : Effective access time = (m + e) a + (2m + e) (1 - a)

TLB lookup time = 10ns

memory access time + TLB lookup miss 130 ns.

Effective access time (EAT) = 82 ns.

On substitution, 82 = (60+10)*a+ (130) (1-a) , a= 0.86

HIT RATIO = 0.86

Question **11**
Correct
Mark 1.0 out of 1.0

A computer system supports 32-bit virtual addresses as well as 32-bit physical addresses. Since the virtual address space is of the same size as the physical address space, the operating system designers decide to get rid of the virtual memory entirely. Which one of the following is true?

- Efficient implementation of multi-user support is no longer possible
- The processor cache organization can be made more efficient now
- Hardware support for memory management is no longer needed ✔
- CPU scheduling can be made more efficient now

The correct answer is:
Hardware support for memory management is no longer needed

Question **12**
Correct
Mark 1.0 out of 1.0

Consider a system with m resources of same type being shared by n processes. Resources can be requested and released by processes only one at a time. The system is deadlock free if and only if

- sum of all max needs is < m-n
- sum of all max needs is = m+n
- sum of all max needs is > m+n
- sum of all max needs is < m+n ✔

The correct answer is:
sum of all max needs is < m+n

Question **13**
Correct
Mark 1.0 out of 1.0

A solution to the Dining Philosophers Problem which avoids deadlock is

- ensure that all philosophers pick up the right fork before the left fork
- ensure that all philosophers pick up the left fork before the right fork
- ensure that one particular philosopher picks up the left fork before the right fork, and that all other philosophers pick up the right fork before the left fork ✔

The correct answer is:

ensure that one particular philosopher picks up the left fork before the right fork, and that all other philosophers pick up the right fork before the left fork

Question **14**
Correct
Mark 1.0 out of 1.0

The condition can be prevented by requiring that a process request all of its required resources at once time and blocking the process until all requests can be granted simultaneously.

- Circular Wait
- Preemption
- Hold and Wait ✔
- Mutual Exclusion

The correct answer is:

Hold and Wait

Question **15**
Correct
Mark 1.0 out of 1.0

Having a small amount of internal fragmentation is the weakness of ..... in memory management.

- Simple segmentation
- Fixed partitioning
- Simple Paging ✔

The correct answer is:
Simple Paging

Question **16**
Correct
Mark 1.0 out of 1.0

Peterson's solution can be applied for how many processes?

- 4
- 3
- 2 ✔
- Any number of processes

The correct answer is:
2

Question **17**
Correct
Mark 1.0 out of 1.0

A critical section is a program segment

- which should run in a certain specified amount of time
- where shared resources are accessed ✔
- which avoids deadlocks
- which must be enclosed by a pair of semaphore operations, P and V

The correct answer is:
where shared resources are accessed

Question **18**
Correct
Mark 1.0 out of 1.0

The optimal page replacement algorithm will select the page that

- Will not be used for the longest time in the future. ✔
- Has not been used for the longest time in the past.
- Has been used least number of times.
- Has been used most number of times.

The correct answer is:
Will not be used for the longest time in the future.

Question **19**
Correct
Mark 1.0 out of 1.0

The operating system and the other processes are protected from being modified by an already running process because :

- every address generated by the CPU is being checked against the base and limit registers ✔
- they are in different memory spaces
- they have a protection algorithm
- they are in different logical addresses

The correct answer is:
every address generated by the CPU is being checked against the base and limit registers

Question **20**

Correct

Mark 1.0 out of 1.0

If there are 32 segments, each size 1 k bytes, then the logical address should have

- 13 bits
- 14 bits
- 15 bits ✔
- 16 bits

The correct answer is:
15 bits