

Started on	Wednesday, 2 April 2025, 11:00
State	Finished
Completed on	Wednesday, 2 April 2025, 11:36
Time taken	36 mins 24 secs
Grade	97.00 out of 100.00

Question 1

Correct

Mark 3.00 out of 3.00

What is **concurrency**?

- ☐ The capability of an operating system to update itself.
- ☒ The ability of an operating system to handle multiple tasks simultaneously. ✓
- ☐ The process by which user rights are managed.
- ☐ The ability of a system to handle requests sequentially.

Question 2

Correct

Mark 3.00 out of 3.00

Which of the following multithreading model has action "creating a user thread requires creating the corresponding kernel thread".

- ☐ One-to-Many model.
- ☐ Many-to-One model.
- ☒ One-to-One model. ✓
- ☐ Many-to-Many model.

Question 3

Correct

Mark 3.00 out of 3.00

One example of a hardware solution to the **critical section problem** is:

- ☐ Compare and Pray.
- ☐ Compare and Shop.
- ☒ Test and Set. ✓
- ☐ Banker's Algorithm.
- ☐ Peterson's Algorithm.

Question 4

Correct

Mark 10.00 out of 10.00

Consider the following scenario of processes and the **First-Come First-Served** (FCFS) scheduling algorithm.

Calculate **the average waiting time** of the system.

Process ID	Arrival time (ms)	Burst time (ms)
P1	0	12
P2	2	4
P3	5	2
P4	8	10
P5	10	6

Answer:

The average waiting time of the system is ms.

Question 5

Correct

Mark 3.00 out of 3.00

You have typed **nano** in WebLinux, and launched the **nano** text editor.

Now, which of the following should be used to get help inside **nano** ?

- ☒ press the Ctrl + G keys ✓
- ☐ press H
- ☐ type nano --help then enter
- ☐ press the Ctrl + H keys

Question 6

Correct

Mark 3.00 out of 3.00

Process **aging** is:

- ☐ Giving a process a longer quantum as it gets older.
- ☒ Boosting a process' priority temporarily to get it scheduled to run. ✓
- ☐ The measurement of elapsed CPU time during a process' execution.
- ☐ Computing the next CPU burst time via a weighted exponential average of previous bursts.

Question 7

Correct

Mark 3.00 out of 3.00

Among CPU scheduling policies, **First Come First Serve (FCFS)** algorithm is attractive because:

- ☐ it minimizes the average turnaround time in the system.
- ☐ it minimizes the average waiting time in the system.
- ☒ it is simple to implement. ✓
- ☐ it is fair to all processes.

Question 8

Correct

Mark 3.00 out of 3.00

Which of the following statements accurately compares threads to processes?

- ☐ Processes can communicate with each other, while threads cannot communicate or share information with other threads.
- ☐ A process can have at most one thread, which inherits all attributes from the process.
- ☒ Processes are independent, while threads are part of the same process and cooperate closely. ✓
- ☐ Threads can only access a small area of memory, while processes can access a larger area of memory.

Question 9

Correct

Mark 3.00 out of 3.00

In order for deadlock to occur all of the following conditions must be met **EXCEPT**:

- ☐ Non-preemption.
- ☒ Rectangular wait. ✓
- ☐ Hold and wait.
- ☐ Mutual exclusion.

Question 10

Correct

Mark 3.00 out of 3.00

Which of the following conditions is enforced by using **wait()** and **signal()** operations on semaphores?

- ☐ Resource holding.
- ☐ Starvation.
- ☒ Mutual exclusion. ✓
- ☐ Aging.
- ☐ Non preemption.

Question 11

Correct

Mark 10.00 out of 10.00

Consider a **Real-Time System** in which there are three processes. Their period and execution time are as follows:

Processes	Execution time, e	Period, p
P1	35	100
P2	10	50
P3	30	150

Answer:

The total utilization of processor is %.

Question 12

Correct

Mark 3.00 out of 3.00

User threads

- ☐ are supported above the kernel and are managed with kernel support.
- ☒ are supported above the kernel and are managed without kernel support. ✓
- ☐ are supported below the kernel and are managed without kernel support.
- ☐ are supported below the kernel and are managed with kernel support.

Question 13

Correct

Mark 3.00 out of 3.00

A **context switch** refers to which of the following?

- ☐ A program calling `exec()` to switch to executing a completely different program within the same process.
- ☐ Starting to execute an interrupt service routine in the middle of executing a user space program.
- ☐ Transitioning from user mode to kernel mode (or vice versa).
- ☒ Moving one process off the CPU and another process into its place. ✓
- ☐ Answer not shown.

Question 14

Correct

Mark 3.00 out of 3.00

_____ is a **non-preemptive scheduling algorithm** that handles jobs based on the length of their CPU burst time.

- ☒ Shortest job first (SJF) algorithm ✓
- ☐ Round Robin (RR) algorithm
- ☐ Priority algorithm
- ☐ First-Come First-Served (FCFS) algorithm
- ☐ none of the mentioned

Question 15

Incorrect

Mark 0.00 out of 3.00

The portion of the process scheduler in an operating system that dispatches processes is concerned with _____

- ☐ assigning running processes to blocked queue.
- ☐ assigning ready processes to CPU.
- ☒ all of the mentioned. ✗
- ☐ assigning ready processes to waiting queue.

Question 16

Correct

Mark 3.00 out of 3.00

When a process is created using the classical **fork()** system call, which of the following is not inherited by the child process?

- ☐ signal handlers.
- ☐ open files.
- ☐ user ID.
- ☒ process ID. ✓
- ☐ process address space.

Question 17

Correct

Mark 3.00 out of 3.00

For two processes accessing a shared variable, **Peterson's algorithm** provides:

- ☐ mutual exclusion.
- ☐ progress.
- ☐ bounded waiting.
- ☒ all of the above. ✓
- ☐ none of the above.

Question 18

Correct

Mark 10.00 out of 10.00

Assume that there are **4 processes**, P1 through P4, and **3 types of resources**: A, B and C.

At time T0, let consider the following snapshot of the system:

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P1	0	1	0	7	5	5	2	3	0
P2	3	0	2	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			

Currently the system in a safe state.

What is the execution order of the processes so that the system remains in a safe state?

- ☒ P2 P4 P3 P1 ✓
- ☐ P4 P3 P1 P2
- ☐ P3 P1 P4 P2
- ☐ P3 P1 P2 P4
- ☐ P1 P3 P2 P4
- ☐ P4 P1 P2 P3
- ☐ P1 P2 P3 P4
- ☐ P2 P1 P3 P4

Question 19

Correct

Mark 15.00 out of 15.00

A number is said to be a **palindrome** number if it reads the same forward and backward i.e., on reversing the digits of the number we get the same number.

Write a C program that starts by reading the number and then the program should display whether a given number is palindrome or not.

Test Case 1:

Input:

121

Output:

121 is a palindrome number.

Test Case 2:

Input:

342

Output:

342 is not a palindrome number.

Answer: (penalty regime: 0, 100, ... %)

Reset answer

```
1 #include <stdio.h>
2
3 int main() {
4     int n, original, reversed = 0, remainder;
5
6     scanf("%d", &n);
7     original = n;
8
9     while (n != 0) {
10         remainder = n % 10;
11         reversed = reversed * 10 + remainder;
12         n /= 10;
13     }
14
15     if (original == reversed)
16         printf("%d is a palindrome number.\n", original);
17     else
18         printf("%d is not a palindrome number.\n", original);
19
20     return 0;
21 }
```

	Input	Expected	Got	
✓	121	121 is a palindrome number.	121 is a palindrome number.	✓
✓	342	342 is not a palindrome number.	342 is not a palindrome number.	✓

Passed all tests! ✓

Correct

Marks for this submission: 15.00/15.00.

Question 20

Correct

Mark 10.00 out of 10.00

Calculate the **predicted burst time** using exponential averaging for the **fifth process** if the predicted burst time for the first process is **10** ms and previous burst time of the first four processes are **2, 4, 6** and **8** ms. Consider **$\alpha = 0.5$** .

The scheduling algorithm is the **Shortest Job First (SJF)**.

Answer:

The predicted burst time for the **fifth process** is ms.