

Started on	Monday, 27 October 2025, 1:18 PM
State	Finished
Completed on	Monday, 27 October 2025, 1:25 PM
Time taken	7 mins 26 secs
Marks	8.00/10.00
Grade	80.00 out of 100.00

Question 1

Complete

Mark 1.00 out of 1.00

A page fault occurs, and the OS finds that the required page is already in memory but not mapped in the page table. This situation is known as:

- ☐ a. Translation fault
- ☐ b. Hard fault
- ☐ c. Double page fault
- ☒ d. Minor (soft) page fault

Question 2

Complete

Mark 1.00 out of 1.00

Consider two threads performing frequent read/write operations on a shared buffer protected by a mutex. Which condition most affects performance?

- ☒ a. Lock contention
- ☐ b. Context leakage
- ☐ c. Deadlock
- ☐ d. Thread starvation

Question 3

Complete

Mark 1.00 out of 1.00

During process context switching, why must the OS flush the TLB on some architectures?

- ☐ a. To load disk pages faster.
- ☒ b. To clear stale virtual-to-physical mappings from the previous process.
- ☐ c. To synchronize threads sharing memory.
- ☐ d. Because TLB entries are stored in the PCB.

Question 4

Complete

Mark 0.00 out of 1.00

In Linux, when a file is read, data is often copied multiple times between components. Which step introduces the most expensive copy operation?

- ☐ a. From CPU cache to register
- ☐ b. From kernel buffer to user-space buffer
- ☒ c. From disk to kernel buffer
- ☐ d. From disk controller to DMA buffer

Question 5

Complete

Mark 1.00 out of 1.00

When a context switch occurs due to an interrupt, which part of the CPU state is not typically saved in the Process Control Block (PCB)?

- ☒ a. Translation Lookaside Buffer (TLB) entries
- ☐ b. General-purpose registers
- ☐ c. Stack pointer
- ☐ d. Program counter

Question 6

Complete

Mark 0.00 out of 1.00

When a process performs a blocking disk read, which event transitions it back to the ready state?

- ☐ a. The disk controller sends an interrupt after the DMA transfer completes.
- ☐ b. The OS detects a soft page fault.
- ☐ c. The process receives a SIGCHLD signal.
- ☒ d. The scheduler's time quantum expires.

Question 7

Complete

Mark 1.00 out of 1.00

Which of the following best explains why a multithreaded program might perform worse than a single-threaded version on a multicore CPU?

- ☐ a. Page table thrashing
- ☐ b. The OS limits all threads to one core
- ☒ c. Cache coherence overhead and false sharing
- ☐ d. Insufficient file descriptors

Question 8

Complete

Mark 1.00 out of 1.00

Which of the following correctly describes a potential race condition between threads sharing a file descriptor?

- ☐ a. Each thread maintains a separate file offset, preventing interference.
- ☐ b. Race conditions cannot occur in file I/O.
- ☒ c. Two threads writing simultaneously can cause interleaved, inconsistent file data.
- ☐ d. Threads always serialize writes automatically.

Question 9

Complete

Mark 1.00 out of 1.00

Which statement accurately describes file system metadata caching?

- ☐ a. Only file data blocks are cached; metadata always resides on disk.
- ☒ b. Metadata (like inodes and directory entries) is cached in kernel memory for faster lookup.
- ☐ c. Metadata is never cached due to consistency constraints.
- ☐ d. Metadata is cached in user-space libraries.

Question 10

Complete

Mark 1.00 out of 1.00

Which synchronization mechanism would you choose for a high-frequency producer-consumer queue in shared memory where busy-waiting is acceptable?

- ☐ a. Barrier
- ☐ b. Condition variable
- ☐ c. Counting semaphore
- ☒ d. Spinlock