Online Exit Test

1. Choosing an Architecture

b) Harvard architecture with a RISC CPU.
↳ separate instruction and data memory → increased throughput → more ideal for real time systems
↳ RISC (simple instructions → executes faster → ideal for ARM based chips (e.g. Drones)

2. CISC vs RISC in Modern CPUs

a) RISC's fixed length instructions simplify pipelining.

3. System bottlenecks Identification

c) Improve memory hierarchy with larger L1 and L2 caches.

↳ will improve cache hit rate → more data can be served quickly without waiting.

4. Matching Workload to a CPU Type

b) Complex database queries involving multiple memory accesses.

CISC cpu's are designed for complex logic workflows → memory access operations

so above workload will benefit the most from it.

5. Memory Hierarchy & Cache

(b) Prefetch data into L1

∴ L3 and L2 cache misses are minimal
⇒ L1 cache is missing due to latency.

6. Improving Multithreaded Performance.

(b) optimize the program to allow parallel execution.

∴ one core is being fully utilized ⇒ architecture is not the problem but the way software is programmed.

7. Storage system Decision

(b) Maximize IOPS (Input Output ops per second)

8. Virtual memory & TLB

(a) Increase page size from 4KB to 2MB

9. Teuton Basic Linux Commands

9.1
(a) chmod

9.2
(b) text searching inside files

9.3
(b) ls -a

10.
(b) Replace SATA SSD with NVMe SSD over PCIe interface

11. Interface speed

(b) Higher sequential read/write speeds and IOPS.

12. RAID config. Choice

(C) RAID 10

It provides both fast performance and fault tolerance.

13. Virtualization vs. Containers

(b) Containers (like Dockers)

↳ It shares OS → takes less starting time.

14. Networking Model understanding

(c) Application layer

∵ TLS / SSL (operates b/w Application & transport layer)

↳ part of application layer for HTTPS.

15. Different Protocols

(b) UDP (user datagram protocols)

↳ It is used in streaming (e.g. youtube), occasional data loss is acceptable but real-time speed is critical.

16. HTTP and HTTPS usage.

(b) HTTPS adds a layer of SSL / TLS encryption over HTTP.

17. OSI & TCP/IP Models

(c) Layer 4 (Congestion / MTU mismatch)

18. Storage Interfaces & Devices

(d) PCI 3.0 x 4 NVME SSD + PCIe 3.0 x 4 NVMe SSD in RAID0