Started on	Wednesday, 19 November 2025, 1:45 PM
State	Finished
Completed on	Wednesday, 19 November 2025, 2:02 PM
Time taken	16 mins 51 secs
Marks	15.00/20.00
Grade	**75.00** out of 100.00

Question 1

Complete

Mark 1.00 out of 1.00

A containerized microservice is experiencing intermittent crashes with "Too many open files". lsof shows many TCP connections in CLOSE_WAIT state. What is the root cause?

- a. Application not closing sockets after peer closes connection
- b. TCP keepalive disabled
- c. Remote peer not sending FIN
- d. Filesystem not using journaling

Question 2

Complete

Mark 1.00 out of 1.00

A DNS resolver in your system is causing high latency. Analysis shows the resolver is performing iterative queries instead of recursive ones. Which configuration mistake likely caused this?

- a. DNSSEC disabled
- b. Resolver marked as authoritative
- c. Missing NS records
- d. TTL too high

Question 3

Complete

Mark 1.00 out of 1.00

A file server using asynchronous I/O shows low throughput. iostat shows high CPU wait time and low queue depth. What is the MOST likely reason?

- a. Application never submitted enough concurrent I/O requests
- b. Kernel uses a single I/O thread
- c. File system lacks journaling
- d. AIO uses synchronous system calls

Question 4

Complete

Mark 1.00 out of 1.00

A firewall is dropping packets due to checksum failures. Packet capture shows MSS clamping on SYN packets. Which system is MOST likely misconfigured?

- a. Path MTU Discovery
- b. VLAN tagging
- c. TCP window scaling
- d. Jumbo frames on WAN interface

Question 5

Complete

Mark 1.00 out of 1.00

A multithreaded AdTran service occasionally freezes. Thread dump shows many threads stuck in WAITING state on a condition variable, even though notify() was called. What is the MOST likely root cause?

- a. Too many context switches
- b. Deadlock on global mutex
- c. Condition variable is non-reentrant
- d. notify() was called before threads entered wait()

Question 6

Complete

Mark 1.00 out of 1.00

A multithreaded application uses fine-grained locking but still suffers from lock contention. Profiling shows the lock is heavily contended during memory allocation. What is the fix?

- a. Use a thread-local allocator (e.g., TLSF, tcmalloc)
- b. Disable ASLR
- c. Increase heap size
- d. Switch to spinlocks

Question 7

Complete

Mark 1.00 out of 1.00

A network is configured with an L3 switch supporting VLANs. Clients in VLAN 10 cannot ping VLAN 20, even though inter-VLAN routing is enabled. ARP entries are correct. What is MOST likely missing?

- a. ACL permitting traffic between VLANs
- b. STP portfast on trunk port
- c. Static route to VLAN 20
- d. DHCP relay on VLAN 10

Question 8

Complete

Mark 0.00 out of 1.00

A process calls fork() and then exec(). Which pages of the parent are MOST likely to cause page faults after fork?

- a. None – fork() maps all pages eagerly
- b. Heap pages only
- c. Code pages only
- d. Stack pages that are written before exec

Question 9

Complete

Mark 1.00 out of 1.00

A real-time OS task misses deadlines, but C PU utilization is below 40%. Scheduler trace shows frequent context switches. What is the MOST likely reason?

- a. Large TLB pages
- b. Interrupt storms causing preemption
- c. Inverted page table misses
- d. Heap fragmentation

Question 10

Complete

Mark 0.00 out of 1.00

A router drops packets for a flow even though the interface has bandwidth available. Queue monitoring shows the “priority queue” is full. Which mechanism likely caused this?

- a. Tail drop in strict priority queue
- b. RED misconfiguration
- c. WFQ starvation
- d. Token bucket overflow

Question 11

Complete

Mark 0.00 out of 1.00

A router running OSPF is experiencing frequent route flaps on a particular interface. Packet captures show repeated LSA flooding every few seconds. Which is the MOST likely cause?

- a. MTU mismatch between routers
- b. Incorrect area ID
- c. Duplicate router IDs in the same area
- d. Dead interval larger than hello interval

Question 12

Complete

Mark 1.00 out of 1.00

A system has large memory but still shows swapping under moderate load. vmstat shows high “majflt” values. What is the root cause?

- a. Swap partition too small
- b. Incorrect dirty page ratio
- c. Overcommit memory enabled
- d. Page cache pressure

Question 13

Complete

Mark 1.00 out of 1.00

A system uses Copy-on-Write extensively. Excessive memory consumption suddenly occurs. Which behavior most likely triggered it?

- a. Parent process modifies many shared pages
- b. TLB shootdown
- c. Frequent read operations
- d. Kernel zeroing pages

Question 14

Complete

Mark 0.00 out of 1.00

In a BGP deployment, a router receives the same prefix from two peers. One path has a shorter AS-PATH but worse MED. Which route will BGP install?

- a. Path with better MED
- b. Path with shorter AS-PATH
- c. Path selected using local preference only
- d. Path with lowest router ID

Question 15

Complete

Mark 1.00 out of 1.00

In a NUMA system, a thread's memory accesses suddenly become slower after migration to another CPU. Which scheduling mistake caused this?

- a. Overbooking logical cores
- b. TLB invalidation
- c. Cross-node memory access due to NUMA imbalance
- d. CPU frequency scaling

Question 16

Complete

Mark 1.00 out of 1.00

Two routers form an IPSec VPN. They are behind NAT devices. The tunnel intermittently fails during high throughput. What is the MOST probable cause?

- a. Tunnel using transport mode
- b. Expired certificates
- c. Incorrect DH group
- d. ESP packets being fragmented

Question 17

Complete

Mark 1.00 out of 1.00

You are analyzing an MPLS LSP failure. The tail end receives Label Withdraw messages. What does this typically indicate?

- a. Upstream router lost the route for the FEC
- b. RSVP-TE tunnel has insufficient bandwidth
- c. Penultimate hop is not performing PHP
- d. LDP session is using incorrect label stack

Question 18

Complete

Mark 1.00 out of 1.00

You are debugging a TCP-based application on an embedded device. You observe that cwnd grows slowly and sometimes resets to 1 MSS even without packet drops. What is the MOST probable reason?

- a. Device is ACKing every segment
- b. Nagle's algorithm is disabled
- c. Receiver window size is too large
- d. Delayed ACKs are triggering spurious fast retransmits

Question 19

Complete

Mark 1.00 out of 1.00

You implement a rate-limiter using a Token Bucket. Traffic bursts still exceed the allowed rate for short intervals. Why?

- a. Bucket size is too small
- b. Leaky bucket is required instead
- c. Shaping is done before policing
- d. Tokens accumulate and allow bursts

Question 20

Complete

Mark 0.00 out of 1.00

You observe that enabling hyperthreading reduces performance of a real-time packet processing thread. Why?

- a. TLB is doubled for HT cores
- b. Two logical cores share execution units
- c. Cache coherence traffic increases
- d. Kernels schedule interrupts on NUMA boundary