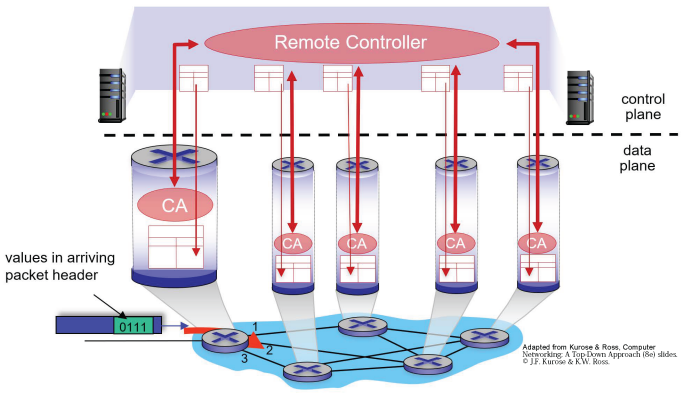
RAT Test Run

Question 1: The figure below illustrates:



A the **switching fabric**, present in both Traditional Routing and Software-Defined Networking (SDN).

B Software-Defined Networking (SDN) because the control plane is **outside** each router (i.e. centralised).

C Traditional Routing because the control plane is implemented **inside** each router (i.e. distributed).

D both Traditional Routing and Software-Defined Networking (SDN) because the **forwarding tables** are present both inside each router and outside.

Question 2: What is the role of the forwarding table within a router?

A To hold entries that determine the outgoing link interface to which **an arriving packet** will be forwarded.

B To hold entries that determine the outgoing link interface to which **a queued packet** at the output will be forwarded.

C To hold routes that determine the path to which **an arriving packet** will be forwarded.

D To hold routes that determine the path to which **a queued packet** will be forwarded.

Question 3: Consider a datagram network using 8-bit host addresses. Suppose a router uses longest-prefix matching and has the following forwarding table:

Prefix Match	Interface
11	0
101	1
110	2
otherwise	3

A datagram with the destination address 11000101 will be forwarded to:

A interface 0.

B interface 3.

C interface 2.

D interface 1.

Question 4: Active Queue Management algorithms were proposed for:

A **proactively** marking and dropping packet **before** buffers are full. An example is the drop-tail policy.

B **reactively** dropping newly arriving packets **when** buffers are full. An example is the Random Early Detection (RED) algorithm.

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Question 5: With Non-preemptive Priority Queuing:

A Arriving high-priority packets **may** have to wait until a low-priority packet is transmitted.

B Arriving high-priority packets will **always** be sent before low-priority packets.

C A queued low-priority packet **may** be transmitted even before the high-priority queue is emptied.

D Arriving packets are **always** classified into high-priority if the high-priority queue is empty.

Question 6: Can Weighted Fair Queueing (WFQ) and Round Robin (RR) behave the same?

A No, because WFQ depends on the weight of a given class while RR **always** alternates between classes.

B Yes, when all classes in WFQ have the same amount of service weight.

C Yes, when all packets arriving in WFQ are placed within the same class.

D No, because with WFQ packets arriving to a prioritised class will **always** leave before others, while RR **always** alternates between classes.

Question 7: A packet scheduler is responsible for:

A choosing one packet, among those **yet to be queued** before transmission, at the **output** port.

B choosing one packet, among those **yet to be queued** before transmission, at the **input** port.

C choosing one packet, among those **queued** for transmission, at the **output** port.

D choosing one packet, among those **queued** for transmission, at the **input** port.

Question 8: Consider a TCP Reno connection that exclusively uses a $20\,\mathrm{Mbps}$ link. Suppose that this link is **the only congested link** between the two hosts participating in the connection. Consider a **large file transfer** under the following assumptions:

- the receive buffer of the receiving host is **much larger** than the congestion window;
- the TCP segment size equals 1250 bytes;
- the RTT equals $200\,\mathrm{ms}$;
- the TCP connection is **always in the congestion avoidance phase**, ignoring slow start;
- packet headers are not considered.

What is the maximum window size (**in segments**) that this TCP connection can achieve?

Tip: Remember that the congestion window cannot increase before an ACK for the corresponding segment is received, which takes RTT seconds.

A 200.

B 400.

C 2000.

D 3200.

Question 9: In Software-Defined Networking (SDN), during a short loss of connectivity to the controller, which switch behavior best maintains forwarding while preserving the separation of control and data planes?

A Keep using previously installed match–action rules with non-zero timeouts so packets continue to be forwarded until rules expire.

B Stop forwarding all packets until the controller connection is restored.

C Send every unknown packet to the controller, since this always works even if the controller is unreachable.

D Run a distributed routing protocol locally on the switch to compute new routes during the outage.

Question 10: Which single scheduler best keeps **delay-sensitive** traffic (e.g., VoIP/interactive) with short queues **without starving** throughput-oriented bulk traffic under load?

A Strict Priority, because high-priority classes should always preempt others even if bulk never gets served.

B FIFO, because treating all packets the same naturally prioritizes delay-sensitive traffic.

C Round Robin with equal turns for all classes, because delay-sensitive traffic should never get more service than bulk.

D Weighted Fair Queueing (WFQ) with higher weights for delay-sensitive classes than for bulk.