Started on	Wednesday, 24 September 2025, 9:01 AM
State	Finished
Completed on	Wednesday, 24 September 2025, 9:06 AM
Time taken	4 mins 52 secs
Grade	**5.33** out of 10.00 (**53**%)

Question 1

Incorrect

Mark 0.00 out of 2.00

In an OpenFlow-based SDN network, a controller installs the following rules in switch **S1**:

1. **Rule R1:** `match: dst_ip = 10.0.0.0/24`, action: output to port 3, **priority = 10**
2. **Rule R2:** `match: dst_ip = 10.0.0.5/32`, action: output to port 2, **priority = 5**
3. **Rule R3:** `match: dst_ip = *` (any), action: send to controller, **priority = 0**

Now, host **H1** connected to **S1** sends packets with the following destinations:

- **Case A:** `dst_ip = 10.0.0.5`
- **Case B:** `dst_ip = 10.0.0.8`
- **Case C:** `dst_ip = 192.168.1.1`

Which of the following correctly describes the forwarding behavior?

Select one or more:

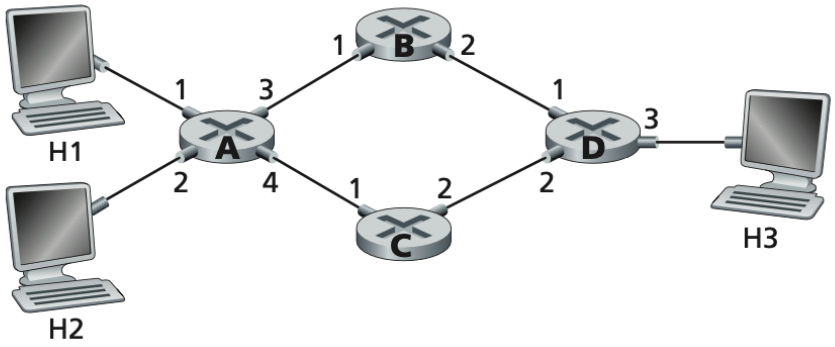
- [ ] a. Case A → port 3, Case B → port 3, Case C → controller
- [x] b. Case A → port 2, Case B → controller, Case C → controller ✗
- [ ] c. Case A → controller, Case B → port 3, Case C → drop
- [ ] d. Case A → port 2, Case B → port 3, Case C → controller

The correct answer is: Case A → port 3, Case B → port 3, Case C → controller

Question 2

Partially correct

Mark 1.00 out of 2.00



Consider a routing policy, such that all traffic from H1 destined to host H3 is forwarded through interface 3, while all traffic from H2 destined to host H3 is forwarded through interface 4?

Select the statements that are correct.

Select one or more:

- [ ] a. It is possible to implement this policy using distance vector routing as studied in class
- [x] b. It is possible to implement this policy using SDN-based routing ✓
- [ ] c. It is possible to implement this policy using link state routing as studied in class
- [x] d. It is not possible to implement this policy ✗

The correct answer is: It is possible to implement this policy using SDN-based routing

Question 3

Correct

Mark 2.00 out of 2.00

Which of the following statements ARE FALSE? Select all that apply.

Select one or more:

- [ ] a. SDN decouples control plane and data plane
- [x] b. SDN eliminates the need for hardware switches entirely, since all forwarding is done in the software at the controller
- [x] c. SDN involves a centralized data plane
- [ ] d. The SDN controller need not have direct physical links with the switches.

The correct answers are:

SDN involves a centralized data plane

,

SDN eliminates the need for hardware switches entirely, since all forwarding is done in the software at the controller

Question 4

Partially correct

Mark 0.33 out of 2.00

Suppose there is an OpenFlow version that allows **only three actions** on packets:

- **Forward** to a specific port
- **Drop**
- **Send to controller**

Which of the following network elements can be implemented using this forwarding abstraction?

Select one or more:

- [x] a. NAT ✗
- [x] b. Layer-2 switch ✓
- [x] c. Firewall ✓
- [ ] d. Layer-3 switch

The correct answers are: Layer-2 switch, Layer-3 switch, Firewall

Question 5

Correct

Mark 2.00 out of 2.00

In an SDN architecture, which of the following statements are true? (Select all that apply).

1. Northbound APIs allow applications to communicate with the SDN controller
2. Southbound APIs allows the controller to manage switches and routers
3. Southbound APIs are used to implement network applications directly on switches
4. Northbound APIs are typically protocol-specific, like OpenFlow

Select one or more:

- [x] a. 1 and 2 ✓
- [ ] b. 3 and 4
- [ ] c. 1 and 3
- [ ] d. 2 and 4

The correct answer is: 1 and 2