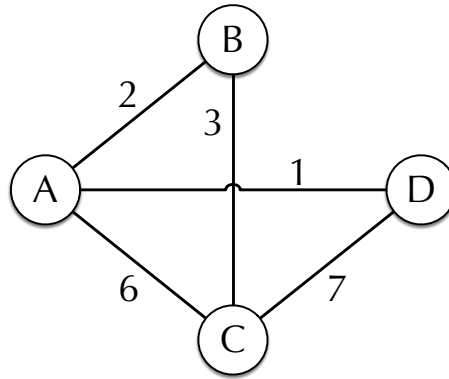# Handout #15: Midterm Solutions — Section L2101

Questions 1-8: All the definitions and concepts in questions 1-8 can be found in the lecture slides.

9a) Shortest path from A to D: A, D, cost 1
Shortest path from B to D: B, A, D, cost 3
Shortest path from C to D: C, B, A, D, cost 6

9b) From the perspective of A, the shortest path to D is A, B, C, D (with a cost of 12)
From the perspective of B the shortest path is not changed and it is still B, A, D, with a cost of 3.
From the perspective of C, the shortest path is still the same as part (a), i.e. C, B, A, D, with a cost of

9c) C send to B, B sends to A, A sends to B, B sends to A, A sends to B, … until TTL reaches 0 and the packet is dropped.

9d) If the distance vector updates are sent periodically, the problem will be resolved as soon as A and D resend the update. In the absence of such periodic updates, the same problem will happen.

10a) Send to R4 (note that the 25th bit from left does not match the first entry).
10b) Send to R2
10c) Send to R4 (again, the 25th bit from left does not match the 3rd table entry here).
10d) Send to R3
10e) Send to R4 (the 26th bit does not match the 4th table entry).
10f) Send to R4

11a) Since MAC addresses are flat (i.e. they don't have the hierarchy that we have in IPv4 for example) we cannot easily combine addresses (the way we do in CIDR). Therefore, the size of the table will grow.
11b) We will have single entries rather than groups of packets, making it easier to track individuals.

12a) The previous connection will be aborted, and a new connection will be established.

12b) Rather than waiting for a 3-4 seconds timeout, we resend the SYN for a new connection.

12c) Triple duplicate ACK is most effective when a single packet is lost out of a longer sequence of back-to-back packets. In wireless networks, losses are bursty.

13a) For load balancing. Incoming requests to a server farm can be sent to different servers to balance the load.

13b) If different flows (or requests) are sent to different servers, we might need a coordination mechanism among servers to ensure the user receives the right service.

14a) A malicious user for instance can send back-to-back messages to a system using someone else's IP address, leading to the original user being blocked, or use different IP addresses to orchestrate for a denial of service attack without being identified.

14b) Such an adapter will block everyone else from speaking.

14c) The bogus ARP reply means the packet will be sent to the rogue computer at the link layer.