EE4204 Computer Networking – Quiz 2 – April 2020

1.
I am fully aware of, and will abide by the NUS Code of Student Conduct (http://nus.edu.sg/osa/resources/code-of-student-conduct) .
Yes.
No

2.
Which of the following is a well-formed IP address?
216.67.5.003
www.ece.nus.edu.sg
264.112.34.9
00-E0-B8-49-52-67

3.
Assume NAT is not being used. Select ALL the statements that are False.
(i) While routing from one subnet to another, the source IP address changes every hop.
(ii) While routing from one subnet to another, the destination IP address changes every hop.
(iii) While routing from one subnet to another, the source MAC address changes every hop.
(iv) While routing from one subnet to another, the destination MAC address changes every hop.
Statements (i) and (iii) are false.
Statements (i) and (ii) are false.
Statements (iii) and (iv) are false.
Statements (ii) and (iv) are false.
None of the statements are false.

4.
As compared to circuit switching, packet switching:
Exploits the randomness of data traffic arrivals.
Requires a longer connection setup phase.
Always offers better quality of service.
Cannot be used for voice services.

5.
What information do the source and destination fields of the Layer 4 packet header contain?
Postal codes
Port numbers
IP addresses
MAC addresses

6.
Which of the following functions does TCP guarantee?
(i) Reliable data transmission
(ii) End-to-end connection
(iii) Secure data transmission
(iv) High speed end-to-end delivery
Options (i) and (iv)
Options (i) and (ii)
Options (i), (ii), (iii), and (iv)
None of the options

7.
Select ALL the statements that are False.
(i) NAT is used by a firewall to translate an IP address to a MAC address.
(ii) In TCP/IP, the transport layer packet header remains the same from source to the destination.
(iii) In TCP/IP, the network layer packet header remains the same from source to the destination.
(iv) In TCP/IP, the link layer packet header changes from source to the destination.
Statements (i) and (iii) are false.
Statements (i) and (ii) are false.
Statements (ii) and (iii) are false.
Statements (ii) and (iv) are false.
None of the statements are false.

8.
Which of the following options can be used by a node running TCP to increase its link utilization?
Increase the maximum window size and decrease the round-trip times.
Increase the maximum window size and open multiple TCP connections.
Stop increasing the congestion window to reduce packet losses.
Open multiple TCP connections and decrease the round-trip times.

9.
What information do the source and destination fields of the Layer 2 packet header contain?
Postal codes
MAC addresses
IP addresses
Port numbers

10.
Select ALL the statements that are True.
(i) UDP is useful in unidirectional communication and suitable for broadcast information.
(ii) UDP does a three way handshake before sending datagrams.
(iii) UDP preserves the order of the packets delivered to the destination.
(iv) The short transmission delays in UDP make it suitable for real-time applications.
Statements (i) and (iv) are true.
Statements (ii), (iii), and (iv) are true.
None of the statements are true.
Statements (i), (iii), and (iv) are true.
Statements (i), (ii), and (iv) are true.

11.
Select ALL the statements that are True.
(i) Congestion control in TCP requires explicit feedback from network routers.
(ii) In TCP slow start, the size of the congestion window increases quadratically.
(iii) The greater the round trip time, the smaller is the throughput of TCP.
(iv) TCP always allocates resources in a max-min fair manner.
(v) In TCP slow start, the size of the congestion window increases exponentially.
Statements (ii), (iii) and (iv) are true.
Statements (iv) and (v) are true.
Statements (ii) and (iii) are true.
Statements (iii) and (v) are true.
None of the statements are true.
Statements (i) and (ii) are true.

12.
What information do the source and destination fields of the Layer 3 packet header contain?
MAC addresses
Postal codes
IP addresses
Port numbers

13.
Is it possible to partition the 192.168.100.0/24 network into 2 subnets, each with 126 hosts?
Yes, it can be done as follows: 192.168.100.128/25 and 192.168.100.0/25
Yes, it can be done as follows: 192.168.100.0/25 and 192.168.100.1/25
Not enough information.
No, it cannot be done because there are not enough addresses to go around.

14.
Assume that TCP is sending segments with a maximum window size of W = 64 KB on a channel that has link rate of 100 MBps and an average round trip time (RTT) of 20 ms. What is the maximum instantaneous throughput?
2.8 MBps
1.2 MBps
3.2 MBps
1.6 MBps

15.

Is it possible to partition the 192.168.100.0/24 network into 4 subnets, each with 88 hosts?

Yes, it can be done as follows: 192.168.100.0/26, 192.168.100.64/26, 192.168.100.128/26, 192.168.100.192/26

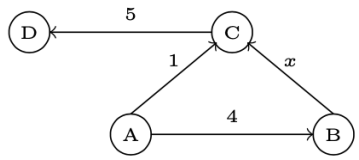
Yes, it can be done as follows: 192.168.100.0/25, 192.168.100.1/25, 192.168.100.2/25, 192.168.100.3/25

Not enough information

No, it cannot be done because there are not enough addresses to go around.

16.

Consider the directed network shown below in which arrows indicate how nodes are connected. What is the smallest value of x for which Dijkstra's Algorithm at node A will find the correct shortest paths?



-3

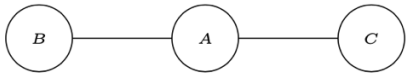
-2

2

-5

17.

In the network shown below, suppose the nodes are running the distance vector (DV) protocol, which has stablized. Then, link A − C breaks and the DV protocol is initiated at node A. How many iterations will it take for the DV protocol to stabilize?



1

It will not stabilize.

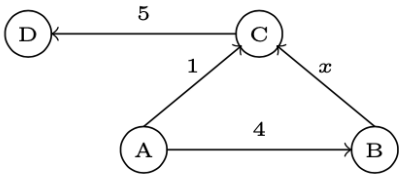
Not enough information.

2

44

18.

Consider the directed network shown below in which arrows indicate how nodes are connected. What is the largest range of x for which Dijkstra's Algorithm at node A will NOT find the correct shortest paths?



x < -5

x > 0

x < -3

x < 0