Computer Networks 2021 Quiz 2

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NOTE: Each student's work unit is unique. You *must* use the work that has been generated for your FAN. If you do not, then you will fail this work unit.

NOTE: You must record your answers in the answer file EXACTLY as required, and commit and make sure your changes have been pushed to the github server, as they will otherwise not be counted.

NOTE: The topic coordinator will periodically run the automatic marking script, which will cause a file called quiz2-results.pdf to be updated in your repository. You should check this file to make sure that your answers have been correctly counted. That file will contain the time and date that the marking script was last run, so that you can work out if it has been run since you last changed your answers. You are free to update your answers as often as you wish, until the deadline for the particular work unit.

1 Quiz#2: Chapters 4 – 6

For each question, you must record your answer in the quiz2-answers.txt file in your git repository. Each statement is either true or false. You must record 't' if you think the statement is true, or 'f', if you think that the statement is false. Your answer must be lower case. Uppercase answers will be marked incorrect. For example, if you believed that the answer to the following question was potato, you would put the word potato at the end of the `rj=` *line in the file* `quiz2-answers.txt`.

Question#	Description
`rj`	*The potato is a white-flesh starchy vegetables from which hot chips are made*

The entry in `quiz2-answers.txt` *would thus look like:*

```
# Question 'rj': The potato is a white-flesh starchy vegetables from which hot chips are made

rj=t
```

Templates for each answer are provided in `quiz2-answers.txt` for your convenience.

Are the following statements true or false?

1.1 Question ab: True or False?

Assuming a 10ms RTT, the 16-bit advertised window field of the TCP header is sufficient to keep a network link of upto about 2.6Mbit/sec full

1.2 Question ac: True or False?

Key network resources to be allocated include the bandwidth of links and processing power of the connected computers

1.3 Question ad: True or False?

Border Gateways exchange route and path information between Autonomous Systems

1.4 Question ae: True or False?

The acknowledgement field of the TCP header only requires inspection if the ACK flag is set

1.5 Question af: True or False?

The TCP sequence number field is at byte offset 4 in the TCP header

1.6 Question ag: True or False?

Transport protocols often have to contend with electromagnetic interference flipping bits in packets

1.7 Question ah: True or False?

The TSpec of a Flowspec describes a network flow's traffic characteristcs

1.8 Question ai: True or False?

Congestion Collapse was implemented in TCP to improve network performance

1.9 Question aj: True or False?

The advertised window field in the TCP header could be extended by several bits without messing up the sliding window protocol

1.10 Question ak: True or False?

UDP provides a simple demultiplexer to support end-to-end communications

1.11 Question al: True or False?

The peak power of a network typically occurs well below the maximum load the network can handle

1.12 Question am: True or False?

Congestion control and resource allocation are two challenges that must each be separately solved by each network

1.13 Question an: True or False?

IPv6's 128-bit addresses are four times longer than IPv4's address, and thus allow 4x more IP addresses than IPv4, thus avoiding the risk of IP address exhaustion

1.14 Question ao: True or False?

Quality-of-Service implies that some packets will be treated differently to others

1.15 Question ap: True or False?

IPv6 improves on IPv4 by reducing the header size to increase payload size

1.16 Question aq: True or False?

Source specific multicast avoids the need for including the source IP address in multicasting forwarding tables

1.17 Question ar: True or False?

TCP uses a three-way handshake when establishing a connection

1.18 Question as: True or False?

Some real-time applications can tolerate lost packets better than others

1.19 Question at: True or False?

UDP allows the multiplexing of traffic from multiple applications on a single host

1.20 Question au: True or False?

Multicast forwarding table collectively specify a set of paths

1.21 Question av: True or False?

The packets exchanged by TCP peers are called segments

1.22 Question aw: True or False?

An example of one-to-many multicast would be online multi-player games

1.23 Question ax: True or False?

Internet routing is largely divided based on intra-AS and inter-AS routing

1.24 Question ay: True or False?

Network flows are streams of related packets that flow through a given Autonomous System

1.25 Question az: True or False?

The DEC Bit is a mechanism for Congestion Avoidance that works by setting a congestion indication bit in packets when network queues grow, thus allowing senders to actively avoid congestion

1.26 Question ba: True or False?

Merriton's Algorithm is typically used to solve the fairness of resource allocation in networks

1.27 Question bb: True or False?

Silly Window Syndrome occurs when a TCP implementation sends many very small segments, instead of waiting to collect enough data to fill a larger segment

1.28 Question bc: True or False?

TCP must be able to handle widely varying Round-Trip Times on networks

1.29 Question bd: True or False?

In a feedback-based system, a host simply begins sending data and responds to feed-back of some kind, to modulate its rate of sending

1.30 Question be: True or False?

The TCP Slow Start algorithm is triggered if the TCP sliding window is exhausted, and a collected ACK advances the sliding window, thus allowing data to again begin to be sent

1.31 Question bf: True or False?

Border Gateway Protocol advertises partial paths that can be assembled to create complete paths to reach given Autonomous Systems

1.32 Question bg: True or False?

"Integrated Services" is a coarse-grained quality-of-service approach

1.33 Question bh: True or False?

Mobile IP requires the use of tunnels or care-of addresses to deliver packets to mobile nodes

1.34 Question bi: True or False?

Controlled Load Service in RSVP means that the network should control the volume of packets of that service that are admitted to the network

1.35 Question bj: True or False?

Jain's Fairness Index is a commonly used approach to assess the fairness of a congestion control algorithm

1.36 Question bk: True or False?

The original TCP retransmission timeout algorithm cannot reliably discern between the reception of the initial transmission or retransmission of a TCP segment

1.37 Question bl: True or False?

Allocating network resources with sufficient precision to avoid congestion is the most common approach to congestion avoidance

1.38 Question bm: True or False?

Whenever the loss of a packet is detected, the TCP congestion control protocol will subtract one packet from the congestion window size, until it receives the next acknowledgement

1.39 Question bn: True or False?

Border Gateway Protocol speakers can cancel previously advertised paths

1.40 Question bo: True or False?

Local traffic is traffic that terminates or originates in an Autonomous System

1.41 Question bp: True or False?

Reverse Path Broadcast is used to propagate the return path for two-way multicast traffic

1.42 Question bq: True or False?

TCP will typically send a segment when it has the number of bytes required to fill a packet, the application has specifically requested it, or a timeout has occurred

1.43 Question br: True or False?

Source-based Congestion Avoidance algorithms use the RTT exclusively to determine whether to adjust the congestion window

1.44 Question bs: True or False?

IPv6 addresses are not allocated on a geographic basis, because IPv6 offers enough addresses that this is not necessary

1.45 Question bt: True or False?

A network flow is an end-to-end abstraction that helps routers to manage network congestion

1.46 Question bu: True or False?

Differentiated Services typically uses a label in a packet header to identify the traffic class

1.47 Question bv: True or False?

The TCP Slow Start algorithm runs at the start of a connection, until the first packet loss occurs

1.48 Question bw: True or False?

Inter-domain routing exists to find optimal routes among the many supplied paths between destinations

1.49 Question bx: True or False?

The DEC Bit with a queue length of 1 is used to attempt to optimise the throughput of the network

1.50 Question by: True or False?

TCP Fast Retransmit works by reducing the TCP retransmission timeout

1.51 Question bz: True or False?

Routing Areas allow groups of backbone routers to be defined

1.52 Question ca: True or False?

Care-of addresses can be used to help avoid inefficient routing to mobile devices

1.53 Question cb: True or False?

All transport protocols ensure messages are delivered in the same order they were sent

1.54 Question cc: True or False?

Randomised Early Detection (RED) is a congestion avoidance algorithm, similar to DECBit

1.55 Question cd: True or False?

Multicast allows a sender to send only one packet, and have it be received my multiple recipients

1.56 Question ce: True or False?

BGP calculates globally comparable path costs between nodes, even when the path crosses many Autonomous Systems

1.57 Question cf: True or False?

The advertised window of a TCP connection should be at least double the bandwidth-delay product of the network path to maximise network throughput

1.58 Question cg: True or False?

RSVP can be used for unicast, while RSVM is used for multicast flows

1.59 Question ch: True or False?

Cloud services are resulting in the creation of many new network functions, such as multicast and traffic engineering

1.60 Question ci: True or False?

Multiple priority queues in FIFO queuing are typically used to ensure that an equal number of packets from each queue are sent per unit time

1.61 Question cj: True or False?

As a byte-oriented protocol, TCP sends one byte at a time

1.62 Question ck: True or False?

Network resource allocation can be either router-centric or host-centric, or both

1.63 Question cl: True or False?

Multi-Protocol Label Switching was used for reliable delivery prior to the wide adoption of virtual circuits as a solution

1.64 Question cm: True or False?

Resource negotiation is a characteristic of all transport protocols

1.65 Question cn: True or False?

Source-based Congestion Avoidance watch for some sign of growing queue lengths in the network path

1.66 Question co: True or False?

Multicast Listener Discover is used to signal the intent to join or leave a multicast group on IPv6

1.67 Question cp: True or False?

The maximum number of unacknowledged bytes in a TCP connection is the minimum of the Advertised Window and Congestion Window

1.68 Question cq: True or False?

Network Address Translation is used to avoid exhaustion of Autonomous System numbers

1.69 Question cr: True or False?

A host can be in only one multicast group at a time

1.70 Question cs: True or False?

TCP offers more services than UDP

1.71 Question ct: True or False?

The large-scale structure of the Internet consists of Autonomous Systems (AS)

1.72 Question cu: True or False?

Multi-provider Internet topologies typically involve peering points

1.73 Question cv: True or False?

It is common for backbone providers to interconnect with each other at a single peering point

1.74 Question cw: True or False?

FIFO and FCFS are two different approaches to packet queuing

1.75 Question cx: True or False?

The power of a network is often expresses as the delay divided by the throughput