Computer Networks 2021 Quiz 2

FAN: daym0019

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?

The TCP slow start algorithm increases the TCP congestion window size more rapidly than if it did not exist

1.2 Question ac: True or False?

The DEC Bit is a mechanism for Congestion Avoidance that works by setting a congestion indication bit in packets that arrive when network queues are full, i.e., congested

1.3 Question ad: True or False?

Voice and video are the only network applications where Quality-of-Service should work to minimise latency. For all other applications bandwidth is the primary consideration

1.4 Question ae: True or False?

The UDP protocol demultiplexes packets arriving at an application into separate queues based on which host they came from

1.5 Question af: True or False?

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

1.6 Question ag: True or False?

A Stub Autonomous System is analogous to a stub function in a program, and contains only exterior interfaces, and lacks internal nodes, and thus exists primarily to carry transit traffic.

1.7 Question ah: True or False?

IPv6 includes authentication and security as compulsory features

1.8 Question ai: 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

1.9 Question aj: True or False?

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

1.10 Question ak: True or False?

The goal of inter-domain routing is to identify rings around which traffic can be circulated, by-passing points of congestion

1.11 Question al: True or False?

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

1.12 Question am: True or False?

The TCP checksum field is at byte offset 16 in the TCP header

1.13 Question an: True or False?

Transport protocols often have to contend with networks delivering messages after arbitrarily long delays

1.14 Question ao: True or False?

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

1.15 Question ap: True or False?

Internet routing became more efficient after the merging of inter-AS and intra-AS routing tables

1.16 Question aq: True or False?

Unlike Randomised Early Detection (RED), DECBit is able to be used with TCP

1.17 Question ar: True or False?

The MSS of a TCP connection is the Maximum Segment Size, which is the MTU of the network link minus the TCP and IP header sizes

1.18 Question as: True or False?

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

1.19 Question at: True or False?

Within an Autonomous System, all internal and border routers must run an inter-domain routing protocol

1.20 Question au: 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

1.21 Question av: True or False?

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

1.22 Question aw: True or False?

RPC is a protocol that sits on top of IP, similar to TCP and UDP

1.23 Question ax: True or False?

Distance-Vector Multicast forwards received multicast packets received from any router on all outgoing links

1.24 Question ay: True or False?

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

1.25 Question az: True or False?

Allocating network resources with sufficient precision to avoid congestion is difficult

1.26 Question ba: True or False?

The Jacobson/Karels algorithm simplifies the TCP retransmission delay, by tracking only the variance in RTT, rather than the RTT itself

1.27 Question bb: True or False?

Multicast causes traffic to be concentrated near the sender

1.28 Question bc: True or False?

It is common for large corporations to connect directly to one or more backbones

1.29 Question bd: True or False?

It is common for intolerant real-time applications to mitigate their intolerance through delay adaptivity

1.30 Question be: True or False?

TCP uses a three-way handshake when establishing a connection

1.31 Question bf: True or False?

TCP offers more services than UDP

1.32 Question bg: True or False?

Whenever a congestion window's worth of data has been acknowledged, the TCP congestion protcol will add one packet's worth of bytes to the congestion window size

1.33 Question bh: 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

1.34 Question bi: True or False?

The TSpec of a flow is easier to define correctly than the RSpec

1.35 Question bj: True or False?

Flowspec can use a Token Bucket Filter to enforce average bandwidth allocations, however this does not work well for variable bitrate sources

1.36 Question bk: True or False?

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

1.37 Question bl: True or False?

The independent nature of Autonomous Systems means that determining meaningful costs for paths that cross multiple Autonomous Systems effectively impossible

1.38 Question bm: True or False?

Randomised Early Detection (RED) does not drop packets if the average queue length is below some threshold

1.39 Question bn: 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

1.40 Question bo: True or False?

Nagle's Algorithm uses received ACKs as implicit timeouts to trigger flushing any data waiting to be sent

1.41 Question bp: True or False?

Reverse Path Broadcast is used to prune networks that contain no members in a given multicast group

1.42 Question bq: True or False?

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

1.43 Question br: True or False?

Congestion control exists to prevent senders from overrunning the capacity of receivers

1.44 Question bs: True or False?

TCP practices Congestion Control rather than Congestion Avoidance

1.45 Question bt: True or False?

The header of a TCP packet is fixed at 20 bytes

1.46 Question bu: True or False?

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

1.47 Question bv: True or False?

TCP implements a reliable data transport for UDP

1.48 Question bw: True or False?

Border Gateways are the routers through which packets enter and leave an Autonomous System

1.49 Question bx: True or False?

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

1.50 Question by: True or False?

The Karn/Partridge algorithm does not sample RTT when retransmitting a segment

1.51 Question bz: True or False?

TCP's congestion control algorithm requires hosts have access to an accurate time authority, such as provided by Network Time Protocol (NTP)

1.52 Question ca: True or False?

Care-of addresses are one of the major causes of inefficient routing in IP mobility

1.53 Question cb: True or False?

Admission Control is a mechanism in RSVP where the network decides if it can satisfy a request for a given quality-of-service. If not, the access is not permitted

1.54 Question cc: True or False?

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

1.55 Question cd: True or False?

FIFO Queuing maintains separate queues per network flow, to improve fairness

1.56 Question ce: True or False?

Border Gateway Protocol was adopted to allow for more flexibility in the interconnection of backbone networks

1.57 Question cf: True or False?

Multicast in IP is structured as a many-to-many system

1.58 Question cg: True or False?

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

1.59 Question ch: True or False?

Congestion Collapse was implemented in TCP to improve network performance

1.60 Question ci: True or False?

Source-based Congestion Avoidance can also use other algorithms that rely on more than just the RTT, such as the advertised window size

1.61 Question cj: True or False?

Increasing the throughput of a network by increasing the number of packets that can be in the network at any point improves both the throughput and delay of the network

1.62 Question ck: True or False?

Differentiated Servicese the port number of TCP and UDP packets to identify the required traffic class

1.63 Question cl: True or False?

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

1.64 Question cm: True or False?

Peering Points are typically only found in wireless ad-hoc networks

1.65 Question cn: True or False?

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

1.66 Question co: True or False?

The maximum segment lifetime in a TCP connection is limited to 120 seconds to prevent unintended wrap-around of the sliding-window protocol

1.67 Question cp: True or False?

The network layer is responsible for ensuring that each message is received only once

1.68 Question cq: True or False?

It is the responsibility of routers to ensure that multicast behaves correctly from the perspective of connected devices

1.69 Question cr: True or False?

Real-time network applications require accurate network time synchronisation, so that latency can be minimised

1.70 Question cs: True or False?

The advertised window field in the TCP header could not be extended without messing up the sliding window protocol

1.71 Question ct: True or False?

Fairness of resource allocation in a network is often as important as effective utilisation of the network

1.72 Question cu: True or False?

Congestion control and resource allocation is handled exclusively by network elements, rather than by the connected devices

1.73 Question cv: True or False?

Each Autonomous System may contain multiple routers

1.74 Question cw: True or False?

TCP Fast Recovery uses outstanding ACKs following a Fast Retransmit to avoid the need for re-using the Slow Start algorithm

1.75 Question cx: True or False?

The role of a transport protocol is to transport packets from one host to another