Computer Networks 2021 Quiz 2

FAN: li2065

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?

Multicast results in increased redundancy and bandwidth consumption

1.3 Question ad: True or False?

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

1.4 Question ae: True or False?

TCP offers more services than UDP

1.5 Question af: True or False?

"Differentiated Services" is a fine-grained quality-of-service approach

1.6 Question ag: 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)

1.7 Question ah: True or False?

The TCP source port field is at offset 0 in the TCP header

1.8 Question ai: 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

1.9 Question aj: True or False?

The packets exchanged by TCP peers are called segments

1.10 Question ak: True or False?

Border Gateway Protocol 4 assumes the Internet is an arbitrarily interconnected set of Autonomous Systems

1.11 Question al: True or False?

Congestion in network often occurs because a connected host has a slower link than the rest of the network

1.12 Question am: True or False?

Border Gateway Protocol speakers can cancel previously advertised paths

1.13 Question an: True or False?

Resource Reservation is a mechanism in RSVP where by users can request particular services, resources or other management decisions to support their quality-of-service needs

1.14 Question ao: True or False?

Various queuing disciplines can be used in network elements to manage or respond to potential network congestion

1.15 Question ap: True or False?

The SYN and RST flags are used when establishing and terminating a TCP connection

1.16 Question aq: 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

1.17 Question ar: True or False?

A significant routing problem is how to make it scale to billions of end nodes

1.18 Question as: True or False?

Route Propagation refers to the movement of user data over existing routes

1.19 Question at: True or False?

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

1.20 Question au: True or False?

Remote Procedure Call is an example of an end-to-end protocol

1.21 Question av: True or False?

TCP throughput may need to be throttled on very fast networks to prevent sliding window wrap-around occurring too frequently

1.22 Question aw: True or False?

The Internet's topology in the early 1990s was a full-mesh network

1.23 Question ax: True or False?

Packet Shuffling is typically the mechanism by which Quality-of-Service policies are put into effect

1.24 Question ay: True or False?

"Integrated Services" is a quality-of-service scheme that, among other things, allows for reservations

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?

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

1.27 Question bb: True or False?

Flowspec can still result in delayed delivery of packets if multiple variable bit-rate services are active

1.28 Question bc: True or False?

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

1.29 Question bd: True or False?

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

1.30 Question be: True or False?

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

1.31 Question bf: True or False?

The advertised window of a TCP connection should ideally be at least as large as the bandwidth-delay product of the network path

1.32 Question bg: True or False?

Real-time network applications require some assurance that the network will meet some kind of timeliness requirement

1.33 Question bh: True or False?

Packet loss is a problem that equally impacts on all real-time applications

1.34 Question bi: True or False?

Congestion control exists to prevent senders from overrunning the capacity of intermediate devices and links on a network

1.35 Question bj: True or False?

When too many packets are contending for the same link, queues overflow and packets get dropped, resulting in congestion

1.36 Question bk: True or False?

Transport protocols often have to contend with networks limiting the number of messages that can be sent

1.37 Question bl: True or False?

Fair-share of bandwidth is a commonly applied measure of fairness of allocation of network resources

1.38 Question bm: True or False?

Network protocols typically guarantee message delivery

1.39 Question bn: True or False?

MPLS, the Multiple Path Link Status protocol, is used to provide traffic engineering to the Internet

1.40 Question bo: True or False?

Naivelly increasing the throughput of a network by increasing the number of packets that can be in the network at any point in time can cause the delay of the network to increase

1.41 Question bp: True or False?

Packet lengths should be taken into account with Fair Queuing (FQ), to ensure actual fair sharing of bandwidth

1.42 Question bq: True or False?

Whenever the loss of a packet is detected, the TCP congestion control protocol will halve the congestion window size, but never reducing it below one full packet's worth of data

1.43 Question br: True or False?

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

1.44 Question bs: True or False?

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

1.45 Question bt: True or False?

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

1.46 Question bu: 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

1.47 Question bv: True or False?

Routers maintain separate multicast forwarding tables from unicast forwarding tables for multicast to function

1.48 Question bw: True or False?

Mobile IP uses home agents, home addresses and foreign agents to facilitate mobility

1.49 Question bx: True or False?

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

1.50 Question by: True or False?

It is common for service providers that mainly provide service to consumers to connect to peering points to access the internet backboke

1.51 Question bz: True or False?

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

1.52 Question ca: True or False?

End-to-end protocols solve the challenge of how to turn process-to-process communications into host-to-host communications

1.53 Question cb: True or False?

Multicast in IP is structured as a one-to-many system, and extensions must be used to implement many-to-many multicast

1.54 Question cc: True or False?

Routing Areas allow groups of backbone routers to be defined

1.55 Question cd: True or False?

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

1.56 Question ce: True or False?

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

1.57 Question cf: True or False?

Internet Group Management Protcol (IGMP) is used to signal the intent to join or leave a multicast group on IPv4

1.58 Question cg: True or False?

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

1.59 Question ch: True or False?

The TCP Slow Start algorithm is used only at the commencement of a TCP connection

1.60 Question ci: True or False?

Guaranteed-Service in RSVP means that the network should guarantee some maximum delay for any packet to be delivered

1.61 Question cj: True or False?

Each Class A address range on IPv6 consists of an 8-bit

1.62 Question ck: True or False?

Each Autonomous System has exactly one border gateway

1.63 Question cl: True or False?

BGP solves the problem of route advertisement trust between Autonomous Systems

1.64 Question cm: True or False?

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

1.65 Question cn: True or False?

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

1.66 Question co: True or False?

A network flow is similar to a channel, but is visible to a given router, rather than being an end-to-end abstraction

1.67 Question cp: True or False?

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

1.68 Question cq: True or False?

Rate-based networking approaches seek to minimise the packet rate on a network, so as to avoid congestion.

1.69 Question cr: True or False?

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

1.70 Question cs: True or False?

Exterior Gateway Protocol replaced Border Gateway Protocol because it was able to enforce a more efficient tree-like topology

1.71 Question ct: True or False?

TCP Fast Retransmit works by reducing the TCP retransmission timeout

1.72 Question cu: True or False?

Silly Window Syndrom occurs when a TCP implementation sets a window size that is larger than the bandwidth-delay product, and thus causes network congestion due to the very large number of packets being sent

1.73 Question cv: True or False?

Randomised Early Detection (RED) drops packets with probability (MaxThreshold - MinThreshold)

1.74 Question cw: True or False?

Fair Queuing performs bit-by-bit interleaving of packets to ensure fair allocation of network bandwidth

1.75 Question cx: True or False?

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