Computer Networks 2021 Quiz 2

FAN: hu0468

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?

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

1.2 Question ac: True or False?

Autonomous System numbers are 32-bit numbers that are automatically generated from the lowest MAC address of the Autonomous System's border gateway routers, ensuring that they are globally unique

1.3 Question ad: True or False?

Routing Domains are typically placed within Autonomous Systems

1.4 Question ae: True or False?

Flowspec solves the problem where multiple variable bit-rate services require less bandwidth than is available on average, but can transiently require more bandwidth than is available

1.5 Question af: True or False?

To ensure scalability, IPv6 removed IPv4's support for mobility

1.6 Question ag: True or False?

Routers use a Congestion Window to inform TCP connections how much data they can transmit at a given time

1.7 Question ah: True or False?

"Integrated Services" is a quality-of-service scheme for packet switched IP networks. It does not support reservations

1.8 Question ai: True or False?

Guaranteed-Service in RSVP means that the network should guarantee that all packets of this service class are not to be dropped

1.9 Question aj: True or False?

The acknowledgement, source and destination ports, and advertised window fields are all involved in TCP's sliding window protocol

1.10 Question ak: True or False?

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

1.11 Question al: 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

1.12 Question am: 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.

1.13 Question an: True or False?

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

1.14 Question ao: True or False?

The goal of inter-domain routing is to find loop-free routes between nodes

1.15 Question ap: True or False?

Transport protocols typically allow the receiver to apply flow control

1.16 Question aq: True or False?

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

1.17 Question ar: True or False?

Soft-state of network flows helps routers to better handle traffic from that flow

1.18 Question as: 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

1.19 Question at: True or False?

Modern routers allow setting the Jain's Fairness Index to control the fairness of congestion control

1.20 Question au: True or False?

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

1.21 Question av: 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

1.22 Question aw: True or False?

BGP relies on providers being able to trust the advertisements provided by other providers

1.23 Question ax: True or False?

Nagle's Algorithm is used in TCP to determine the optimal MSS for a connection

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?

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

1.26 Question ba: True or False?

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

1.27 Question bb: True or False?

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

1.28 Question bc: True or False?

Distance-Vector Multicast forwards received multicast packets on all outgoing links, but only if the packets arrive via the correct router

1.29 Question bd: True or False?

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

1.30 Question be: True or False?

Unicast forwarding table collectively specify a set of paths

1.31 Question bf: True or False?

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

1.32 Question bg: True or False?

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

1.33 Question bh: True or False?

Border Gateway Protocol combines the strengths of distance vector and link-state routing protocols

1.34 Question bi: True or False?

UDP provides reliable byte stream communications to support end-to-end communications

1.35 Question bj: True or False?

Resource Reservation is a mechanism in RSVP where a network segment can be quarantined for use only by quality-of-service demanding services

1.36 Question bk: True or False?

TCP offers a byte-stream service to applications, which is implemented by sending packets

1.37 Question bl: True or False?

The TSpec of a Flowspec describes the network service that has been requested

1.38 Question bm: True or False?

Multicast results in increased redundancy and bandwidth consumption

1.39 Question bn: True or False?

Congestion control was implemented in TCP after several years to solve the problem of congestion collapse

1.40 Question bo: True or False?

IPv6 addresses are allocated on a provider and geographic basis

1.41 Question bp: True or False?

A multicast host does not need to know the membership of a group in order to send a packet to the group

1.42 Question bq: True or False?

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

1.43 Question br: True or False?

TCP Fast Retransmit works by reducing the TCP retransmission timeout

1.44 Question bs: 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 26Mbit/sec full

1.45 Question bt: True or False?

The TCP slow start algorithm increases the TCP congestion window size more slowly during the initial stages of a connection

1.46 Question bu: True or False?

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

1.47 Question bv: True or False?

TCP can be used to transfer data using the full capacity of network links of any speed, as the sliding window algorithm will correct any out-of-order delivery

1.48 Question bw: True or False?

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

1.49 Question bx: True or False?

Routing Areas allow groups of backbone routers to be defined

1.50 Question by: True or False?

The UDP header contains source port, destination port, checksum and length fields

1.51 Question bz: True or False?

Drop policy is another name for the queuing scheduling policy, i.e., deciding which packets get sent and which get dropped when congestion occurs

1.52 Question ca: True or False?

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

1.53 Question cb: True or False?

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

1.54 Question cc: True or False?

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

1.55 Question cd: True or False?

TCP normally buffers enough bytes to fill a reasonable sized packet on the receive side, to reduce the number of times an application must poll for data

1.56 Question ce: True or False?

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

1.57 Question cf: True or False?

In a reservation-based system, each router allocates enough resources for a request. If the request cannot be met, the router rejects the reservation.

1.58 Question cg: True or False?

If the TCP Slow Start algorithm is re-started, the Congestion Threshold is reset to 0

1.59 Question ch: True or False?

TCP Fast Recovery uses the Fast Start mechanism instead of the Slow Start mechanism whenever the Fast Retransmit mechanism detects congestion

1.60 Question ci: True or False?

Each Autonomous System may contain multiple routers

1.61 Question cj: True or False?

Source-based Congestion Avoidance works by having routers provide a separate packet queue for each source

1.62 Question ck: True or False?

When a mobile IP device moves networks, the home agent may need to send a binding warning notice

1.63 Question cl: True or False?

Network resource allocation is either one of router-centric or host-centric

1.64 Question cm: True or False?

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

1.65 Question cn: True or False?

It is up to an application using a TCP implementation to decide when it has enough bytes to send a segment

1.66 Question co: True or False?

TCP practices Congestion Avoidance rather than Congestion Control

1.67 Question cp: True or False?

One approach to congestion control is to allow sources to send as much data as they want, dropping excess packets, and recovering from such congestion when it occurs

1.68 Question cq: True or False?

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

1.69 Question cr: True or False?

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

1.70 Question cs: 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

1.71 Question ct: True or False?

Autonomous Systems refer to the large junction points on the Internet

1.72 Question cu: 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

1.73 Question cv: True or False?

An example of one-to-many multicast would be radio station broadcast

1.74 Question cw: 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

1.75 Question cx: True or False?

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