# Computer Networks 2021 Quiz 2

## FAN: lewi0231

*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?

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

### 1.2 Question ac: 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

### 1.3 Question ad: True or False?

A multicast host needs to know the membership of a group in order to send a packet to the group

### 1.4 Question ae: True or False?

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

### 1.5 Question af: True or False?

Queuing disciplines in network elements have no impact on congestion: The problem is that there are too many packets to be sent

### 1.6 Question ag: True or False?

The TCP checksum field is calculated over data from only the TCP header

### 1.7 Question ah: 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

### 1.8 Question ai: True or False?

Flowspec can use a Token Bucket Filter to enforce average bandwidth allocations, while still allowing for brief bursts of higher data rates

### 1.9 Question aj: True or False?

Multi-provider Internet topologies typically involve peering points

### 1.10 Question ak: True or False?

Neither TCP nor UDP is ideally suited to the needs of Remote Procedure Call (RPC)

### 1.11 Question al: True or False?

The packets exchanged by TCP peers are called frames

### 1.12 Question am: True or False?

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

### 1.13 Question an: True or False?

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

### 1.14 Question ao: True or False?

Transport protocols typically support synchronising sender and receiver

### 1.15 Question ap: True or False?

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

### 1.16 Question aq: 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

### 1.17 Question ar: True or False?

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

### 1.18 Question as: True or False?

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

### 1.19 Question at: True or False?

IPv6, like IPv4, allows the use of IPSec, but does not make it compulsory

### 1.20 Question au: True or False?

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

### 1.21 Question av: True or False?

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

### 1.22 Question aw: True or False?

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

### 1.23 Question ax: True or False?

Congestion Collapse was implemented in TCP to improve network performance

### 1.24 Question ay: True or False?

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

### 1.25 Question az: True or False?

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

### 1.26 Question ba: True or False?

RSVP can be used for both unicast and multicast flows

### 1.27 Question bb: True or False?

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

### 1.28 Question bc: True or False?

FIFO and FCFS are two different approaches to packet queuing

### 1.29 Question bd: True or False?

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

### 1.30 Question be: True or False?

Multicast causes traffic to be concentrated near the sender

### 1.31 Question bf: True or False?

Route Propagation refers to sharing of routing information throughout a network or inter-network

### 1.32 Question bg: True or False?

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

### 1.33 Question bh: True or False?

Source Specific Multicast offers improved one-to-many multicast support for IP

### 1.34 Question bi: True or False?

Nagle's Algorithm is used in TCP to minimise data delivery latency with avoiding Silly Window Syndrome

### 1.35 Question bj: True or False?

IPv6 addresses are allocated on a provider and geographic basis

### 1.36 Question bk: True or False?

Multicast Listener Discover is used to signal the intent to join or leave a multicast group on IPv4

### 1.37 Question bl: 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.

### 1.38 Question bm: True or False?

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

### 1.39 Question bn: 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

### 1.40 Question bo: True or False?

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

## 1.41 Question bp: True or False?

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

## 1.42 Question bq: True or False?

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

## 1.43 Question br: True or False?

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

## 1.44 Question bs: True or False?

TCP Fast Retransmit works by reducing the TCP retransmission timeout

## 1.45 Question bt: True or False?

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

## 1.46 Question bu: True or False?

Latency as well as bandwidth are important for providing the necessary Quality-of-Service for various network applications

## 1.47 Question bv: True or False?

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

### 1.48 Question bw: True or False?

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

### 1.49 Question bx: True or False?

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

### 1.50 Question by: True or False?

Routing Areas refer to the different algorithm areas in routing protocol design

### 1.51 Question bz: True or False?

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

### 1.52 Question ca: True or False?

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

### 1.53 Question cb: True or False?

A Multihomed Autonomous System has multiple connections to other Autonomous Systems, allowing it to carry both local and transit traffic

### 1.54 Question cc: True or False?

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

### 1.55 Question cd: 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

### 1.56 Question ce: 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

### 1.57 Question cf: True or False?

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

### 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?

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

### 1.60 Question ci: True or False?

TCP is byte-oriented

### 1.61 Question cj: True or False?

The Jacobson/Karels algorithm uses a retransmission delay close to the estimated RTT when RTT variance is small, but which grows quickly as the variation in RTT grows

### 1.62 Question ck: True or False?

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

### 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?

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

### 1.65 Question cn: True or False?

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

### 1.66 Question co: True or False?

Flowspec is a mechanism in RSVP for providing routers with additional information to enable them to better meet quality-of-service promises

### 1.67 Question cp: 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

### 1.68 Question cq: 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

### 1.69 Question cr: True or False?

UDP is a simple multiplexer that allows the packets from multiple hosts to be carried over the same link

### 1.70 Question cs: True or False?

Each Autonomous System should contain only a single router

### 1.71 Question ct: True or False?

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

### 1.72 Question cu: True or False?

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

## 1.73 Question cv: 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

## 1.74 Question cw: True or False?

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

## 1.75 Question cx: True or False?

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