Networks Homework 4 (Due Friday 9/11/2020)

Problem #11 looks exactly the way it's supposed to.

1. Which of the following is *not* part of the UDP header?

   (a) source port (b) destination IP address (c) message length (d) checksum

2. Suppose a few students in class create a new service called HWAP (the 355 homework answering protocol). They decide to run this service on some servers they control and they run it at port 80. What will happen?

   (a) IANA (Internet Assigned Numbers Authority) will send a cease-and-desist order since the students are using a port reserved for web traffic.

   (b) Some people may be a bit confused that the service is running on port 80, and the students may get some unexpected web traffic, but otherwise nothing much will happen.

   (c) Running the service on port 80 will cause their network card to catch fire.

3. Suppose you want to make a certain website on your server only available to certain people. So you tell your server to listen for requests to this site on port 44320. Users would have to know this port in order to connect. How secure is this?

   (a) Highly secure since 44320 is a very unlikely port number.

   (b) It will keep ordinary people away, but not people using port scanners.

   (c) None of the above since web servers must listen on ports 80 or 443.

4. To detect data corruption, the UDP checksum should be calculated by

   (a) the sender only (b) the receiver only (c) both the sender and receiver

5. IMAP is typically run either at port 143 or port 993. Internet references say that port 993 is specifically for if we want to access IMAP "securely". What do they mean by "securely"?

   (a) It's at an unusual port number, so hackers will not likely be sniffing network traffic at that port.

   (b) IMAP is not encrypted by default, but if it is run over TLS, then port 993 is used.

   (c) Port 143 is only accessible over SSH.

   (d) Port 143 does not require the user to log on with a password to read their mail.

6. This is a portion of a transcript showing what protocol in use?

```
HELO cmsci355.msmary.edu
S: 250 Welcome
C: MAIL FROM:<brainhienhold@msmary.edu>
S: 250 Ok
C: RCPT TO:<ucantspelrite@msmary.edu>
S: 250 Ok
DATA
```

7. If I build a server for this class and give everyone accounts on it, which standard port should I use so that people can securely log onto the machine and do things like create and edit files.

8. To start a TCP connection, one side sends a segment with the _____ flag set. The other side sends back a segment with the _____ and _____ flags set. The first side then sends back a segment with the _____ flag set.

9. True or false.
   (a) POP3 is the simpler of the two main email retrieval protocols.
   (b) It is possible to view the headers of an email to see which mail servers the email passed through.
   (c) If more than one bit is corrupted in a data transfer over a network, then the UDP checksum will detect it.
   (d) If a packet is lost in transmission, UDP will let the application layer know.
10. The data 1001000111100101011000110101010 is computed using the UDP checksum, what will the checksum be? Please give its value in hex.
11. VGhlIGFuc3dlciB0byB0aGlzIHF1ZXN0aW9uIGlzICIyIG1pbGxpb24gdG9ucyBvZiBrZXRjaHVwI i4gIFBsZWFzZSB3cml0ZSB0aGF0IGFzIHlvdXIgYW5zd2VyIHRvIHRoaXMgcHJvYmxlbS4=
12. Convert the decimal number 123 into binary.
13. Convert the binary number 00101111 to hex.
14. HB32 is a base 32 system. Unlike hex, where the digits run 0-9 and A-F, HB32 starts with A-Z and then a-f (so A=0, B=1, C=2, . . . , Z=25, a=26, . . . f=31). This purposely bizarre system is something I just made up so that you can't use online converters. Convert the following binary number into HB32: 001001111100001. [Hint: you would want to group the binary bits similar to converting to hex or Base64.]