Name: Class:

Task 1

(a) Draw a diagram to show how protocols are used in the sending and receiving of email.   
Your diagram should include SMTP for sending email and either POP3 or IMAP for receiving email.

(b) Annotate your diagram to label devices, servers and protocols used

Task 2

For each of the following protocols, write what it stands for and its purpose.

The first row has been completed for you.

|  |  |  |
| --- | --- | --- |
| **Protocol** | **Stands for** | **Purpose** |
| **POP3** | Post Office Protocol 3 | Retrieving emails from a mail server. When emails are retrieved, they are transferred to your device and deleted form the server. |
| **IMAP** |  |  |
| **SMTP** |  |  |
| **VoIP** |  |  |
| **HTTP** |  |  |
| **NFC** |  |  |
| **HTTPS** |  |  |

Task 3

The following table shows the bandwidth and latency of four different users Internet connections.

Complete a rating for each of the connections with 1 being the best and 4 being the worst.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **User** | **A** | **B** | **C** | **D** |
| Bandwidth | 25.41 Mbps | 72.03 kbps | 75.59 Mbps | 2.32 Mbps |
| Latency | 19 ms | 102 ms | 7 ms | 41 ms |
| Rating |  |  |  |  |

Task 4

Go to the website <https://www.speedtest.net/>

(a) Run three different speed tests and complete the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test number** | **Download speed / Mbps** | **Upload speed / Mbps** | **Latency (ping) / ms** |
| **1** |  |  |  |
| **2** |  |  |  |
| **3** |  |  |  |

(b) What type of connection to the Internet do the download and upload speeds imply?

(c) Why are the speeds and latency not always exactly the same?

(d) Change the location of the server that is being used to one that is located in New York. What happens to the latency / ping time?

(e) Go to <https://wondernetwork.com/pings/London>. What is the typical ping time / latency from London to New York given on this page?

(f) Why does this ping time differ slightly to what you found?

Task 5

Complete the table below, explaining what each file format and codec stands for, is used for and whether it is lossy or lossless.

|  |  |  |  |
| --- | --- | --- | --- |
| **File format / codec** | **Stands for** | **Used for** | **Lossy / lossless** |
| **JPEG** |  |  |  |
| **MP3** |  |  |  |
| **PNG** |  |  |  |
| **MPEG-4** |  |  |  |
| **AAC** |  |  |  |
| **GIF** |  |  |  |

Task 6

A music company records, edits and sells music from upcoming artists.

(a) When they record the music, they use an audio format that is lossless. Why do they not use a lossy compression format such as MP3?

(b) The artists want to have a CD of albums they produce. CDs are an old standard that do not make use of any compression. Why was compression not used on CDs?

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(c) The music company distributes the music online using the MP3 audio format. Why do they use a lossy compression?