# Worksheet 4 TCP/IP Answers

**Task 1**

A file is being transmitted across an Ethernet network using File Transfer Protocol (FTP)   
and TCP/IP.

Label the diagram to explain what is happening at each stage of the communication process and add arrows to show the direction of travel.

|  |  |  |
| --- | --- | --- |
| **Application Layer** |  | **Application Layer** |
| FTP used to present file to be transferred; FTP uses two different ports 20 and 21. |  | FTP receives file requested |
| **Transport Layer** |  | **Transport Layer** |
| Establishes connection; TCP breaks file into packets and individually numbers them |  | Deals with error detection; TCP reconstructs the packet in order |
| **Internet Layer** |  | **Internet Layer** |
| IP adds destination IP address;  Routes the packets |  | IP header removed from each packet |
| **Link Layer** |  | **Link Layer** |
| MAC address added and formatted to send across network cable |  | Signals received and MAC address removed |

Explain why TCP and IP are able to work with different application protocols and different network media, (for example HTTP web pages transferred via a fibre optic connection.)

TCP receives data to transfer from layer above and splits it into packets regardless of content.

IP sends addressed packets to the layer below which controls the conversion onto the physical network.

Layers are separate and have no influence on processes above and below, they only act on data they are given and pass to the next layer.

**Task 2**

Order the following steps showing how a web page is downloaded from a webserver and rendered on the client computer:

|  |  |
| --- | --- |
| **Description** | **Order** |
| Client requests other resources from webserver as specified by HTML file | 3 |
| Sever transmits HTML text file outlining the structure of the web page | 2 |
| Additional resources added to webpage structure to complete the download of the web page | 5 |
| Client requests web page from server | 1 |
| Server transmit additional resource files | 4 |
| Web page structure rendered by client within web browser | 6 |

**Task 3**

Email can be accessed on a server using two different protocols, POP3 and IMAP.

Discuss the differences between these.

Both allow access to email stored on a server.

POP3 downloads these messages and removes them from the server once completed.

IMAP organises the email on the server but does not download them to the client – only the email header is downloaded to the client device.

POP3 email means that any other device that accesses the same email account will not be able to see the emails once downloaded or viewed on another device.

IMAP holds the emails on the server therefore multiple devices can access the same account and see all the emails.

Because IMAP stores all emails and attachments, storage on the server can be used up quickly.

As POP3 downloads the emails and attachments, the email server will not require much storage capacity.