Name: Class:

Task 1

A consultancy firm has 500 employees. Each one of them has a desktop personal computer. Most employees will also use a company laptop, which they may wish to plug in at work or use at home.

Employees also have a company or personal smartphone.

The company makes heavy use of cloud applications and at times employees will need to upload and download large files.

All employees will need access to the corporate LAN via their laptops when away from the office.

(a) In the table below, identify all the user needs for the company. The first row has been completed for you as have two further user needs.

(b) For each user need, specify what type of network, hardware or software should
be specified.

|  |  |
| --- | --- |
| **User needs** | **Network specifications** |
| 500 desktop personal computers connection to the LAN | 500 ethernet cables – Cat 5e11 switches (with 48 ports each) |
| 500 laptops wired connection to the LAN |  |
| 500 laptops wireless connection to the LAN |  |
|  |  |
|  |  |

Task 2

Wi-Fi is a set of standards for wireless connections. It is also referred to as 802.11.

Research the different standards used for Wi-Fi. In particular, focus on the following features:

* The year the standard was first used
* The different speeds
* The frequencies used
* Any other relevant features

List each of the standards and their features below.

Task 3

There are many different companies that supply broadband including:

* BT
* PlusNet
* Sky Broadband
* Virgin Media
* TalkTalk
* Zen Internet

(a) Choose **two** packages from those offered by the suppliers above. What do these packages include?

(b) Find a package aimed at businesses. What different features or services are offered?

Task 4

A small manufacturing company currently has a connection to the Internet using a copper cable. The bandwidth is 5Mbps down and 1Mbps up.

The connection is too slow for their current needs and they are looking to upgrade.

They are considering upgrading the copper cable to Fibre to The Cabinet (FTTC) or installing a new Fibre Optic line direct to the premises (FTTP).

What considerations should they make regarding the implementation of these connection types. Specifically, the timescales involved, testing and downtime.

Task 5

**Two** scenarios are given at the end of the question. For each scenario, select the most appropriate network.

The following network types are available to choose from:

* LAN
* VPN
* WAN (Leased or Public line)
* PAN

In addition, you will need to explain the factors which affect the choice of the network.

Consider the following factors in your explanations:

* Cost
* Efficiency
* Compatibility
* Implementation
* Productivity
* Connectivity
* Security
* Specifications
* User needs
* User experience

**Case Study 1:**

Andrew and Sarah both work for the same company. The often work from home, especially when they are working on the same project. They would like to create a home office which will allow them to easily access documents on either of their computers, as well as sharing both a printer and a scanner. The company are not providing any financial support for this system, and they will not need to access any files from the office.

Explain which network they should use and provide reasons linked to at least **three** factors for your choice.

**Case Study 2:**

A government agency needs to connect multiple offices together to create one large, secure network. They have five large office buildings throughout the United Kingdom. Their staff are responsible for uploading a huge amount of information to the internet and sending it to other departments for analysis. The agency is involved in national security, so it is vital that all information is sent securely. The agency needs the upload speeds to match the download speeds and the performance to be consistent throughout the day.

Explain which network they should use and provide reasons linked to at least **three** factors for your choice.