

Topic 7: Cyberspace, network security and data transfer	Do I understand how to ...
	• define the term cybercrime and give examples of threats to cybersecurity, including: – hacking; – pornography; – cyber stalking; – data theft; – denial of service; – digital forgery; – cyber defamation; – spamming; and – phishing; • define the term malware and describe the following forms of malware: virus, Trojan horse, worm, key logger and spyware; • explain how networks and data can be protected using encryption, passwords, levels of access, backup and firewalls; • describe the role of a protocol in data transfer; • describe the purpose of the following protocols: • File Transfer Protocol (FTP); • HyperText Transfer Protocol (HTTP); • HyperText Transfer Protocol Secure (HTTPS).

9 (a) What do the letters HTTPS stand for?

Hyper Text Transfer Protocol Secure [1]

(b) State the purpose of a protocol in data communication.

- A set of rules, that permit 2 PCs to communicate across a network.
- Allows hardware devices made by different manufacturers to communicate. [2]

Shefaa's email account has been hacked and she needs to change her password.

(c) What advice would you give Shefaa when she is choosing a new secure password?

- At least 8 characters long
- Combination of numbers, upper/lower case and symbols. [2]

(d) Shefaa has received an email containing a Trojan horse virus. Describe how a Trojan horse virus can enter and damage computer systems.

- Gains entry to a user's PC 'in disguise'.
- Tricks the user into opening/downloading a program, which can delete files [2]



10 Anne's multimedia company creates posters, logos and digital advertisements.

(a) The image, sound and video data can be created in a number of file formats.

(i) Circle the compressed file formats in the list below.

JPEG

MP3

MIDI

AVI

MP4

[3]

(ii) Data files can be compressed using lossy or lossless compression.
Describe the difference between the two types of compression.

- Lossless means the picture does not lose any of its original quality even when compressed
- Lossy reduces the file size by removing data and reduces quality [2]

(b) Anne has decided to make use of cloud computing but she is concerned about cybersecurity and cybercrime.

What is cybercrime?

Using a computer to commit a crime via the Internet, eg, cyber-stalking [2]

(c) Describe how levels of access can help prevent data theft on a network.

Ensures authorised users have correct access
Prevents unauthorised users from accessing data eg read only. [2]

[Turn over]



8 Communicating online poses security problems.

(a) What is a communication protocol?

It is a set of rules, for defining methods of data communication between different devices.

[2]

(b) Which of the following protocols FTP or HTTPS is required to ensure that data transmitted is secure?

HTTPS

[1]

(c) Explain what is meant by a "phishing" email attack.

An attempt to get personal or sensitive information.

[1]

(d) Place the correct term beside the definitions in the table. (Not all terms will be used.)

WORM

SPYWARE

VIRUS

KEY LOGGER

Definition	Term
Collects user information without permission and sends it to a remote computer	SPYWARE
Software that can self-replicate on networks and cause damage to data	WORM
Software used to record each keystroke on a computer	KEY LOGGER

[3]



Organisations use encryption to protect data.

(e) Explain the term encryption.

- Data is unreadable if intercepted.
- Encoding or scrambling data. [2]
- Unscrambling data using a key.

[Turn over

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8 Describe each of the following cybercrime threats.

QWC

Quality of written communication will be assessed in this question.

Answers should include:

Phishing

- Designed to catch data → bank detail, security code, passwords.
- Victim receives & responds to a ^{fraudulent} communication that appears to be from a known source.
- Fraudster captures private information before victim realises.
- Often uses emails. - Trying to access data of another person.

Denial of Service

- PC repeatedly sends requests to server - bombarding.
- Requests overload/flood the network with traffic.
- Requests will slow system down & may take the website offline for a short time.
- A malicious attempt to disrupt normal traffic to the web.
- Difficulty responding to legitimate requests.

[6]

Level 1: Basic structure

(1-2) Limited use of SPG

Meaning unclear

No structure or specialist terms.

Level 2: ↓

(3-4)

Level 3: Fully describe the two threats

(5-6)

Good use of SPG

Meaning of text always clear

Good structure & specialist terms.

Turn over

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[illegible]

Malware	Tick (✓)
Firewall	
Worm	✓
Router	
Virus	✓

[2]

(b) (i) Explain how encryption can be used to protect data.

- Data is encoded by sending computer.
 - Uses a software key.
 - Data can only be decoded if recipient has same software key.
- [2]

[2]

1. Prevents unauthorised access to the network. [1]

[1]

2 - Prevents viruses from entering the network [1]

[1]

3. - Can prevent users from sending data out of the network.

12 Cyberspace has provided a new location for crime to be committed.

Explain the term cyberspace **and** describe **two** examples of cyber crime.

Quality of written communication will be assessed in this question.

Cyberspace

- Computer network of worldwide network of computers
- Virtual space where digitised info is communicated.
- Use of Internet to store and exchange data.
- Virtual space in which the electronic data of worldwide PCs circulate.

Example 1

- Hacking:

Example 2

- Spamming:

[6]

Pornography:

Cyberstalking:

Data Theft:

Denial of Service:

Digital Forgery:

Cyber Defamation: