QUESTION 1.

2 The incomplete table below shows descriptions and terms relating to malware.

(a) Complete the table with appropriate descriptions and terms.

	Description	Term
A	Unsolicited emails containing advertising material sent to a distribution list.	....
B	A standalone piece of malicious software that can reproduce itself automatically.	....
C	....	Pharming
D	....	Phishing

[4]

(b) For one of the terms, describe:

- a problem that might arise for a user
- a possible solution to the problem

Choose between the terms:

A / B   (circle your choice)

Problem ....

....

Solution ....

....[2]

(c) Explain the following terms:

Encryption ....

....

....

....

Public key ....

....

....

....[2]

(d) A user downloads software from the Internet.

(i) State what should be part of the download to provide proof that the software is authentic.

....[1]

(ii) Describe the process for ensuring that the software is both authentic and has not been altered.

....

....

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....[4]

3 The incomplete table below shows descriptions and terms relating to malware.

(a) Complete the table with appropriate descriptions and terms.

	Description	Term
A	Sending emails which contain a link to a website that attempts to trick users into giving confidential personal data.	....
B	It replicates by inserting itself into another piece of software.	....
C	....	Worm
D	....	Spam

[4]

(b) Choose term A **or** term B and describe:

- a problem that might arise for a user
- a possible solution to the problem

Term ....

Problem ....

....

Solution ....

....[2]

(c) Explain the following terms:

Cipher text ....

....

....

Private key ....

....

....[2]

(d) Bill, a manager of a company, sent an email with very sensitive information to a work colleague, Alison. However, Bill also accidentally sent it to everybody in the company.

Describe the method used that ensured only Alison was able to read the original contents of the email.

....

....

....

....

....

....[4]

6 **(a)** The table below gives descriptions of three types of malware.

Description	Term
Malware that attaches itself to another program.	
Malware that redirects the web browser to a fake website.	
Email that encourages the receiver to access a website and give their banking details.	

Complete the table by adding the correct terms. [3]

(b) Ben wants to send a highly confidential email to Mariah so that only she can read it. Plain text and cipher text will be used in this communication.

(i) Explain the terms plain text and cipher text.

Plain text ....

....

Cipher text ....

.... [2]

(ii) Explain how the use of asymmetric key cryptography ensures that only Mariah can read the email.

....

....

....

....

....

....

....

.... [4]

2 The following incomplete table shows descriptions and terms relating to malware.

(a) Complete the table with appropriate description and terms.

	Description	Term	
(i)	A standalone piece of malicious software that can replicate itself using a network.	....	[1]
(ii)	Use email to attempt to obtain an individual's confidential data.	....	[1]
(iii)	....	Virus	[2]

(b) State **two** vulnerabilities that the malware in **part (a)(i)** or **part (a)(iii)** can exploit.

Vulnerability 1 ....

....

Vulnerability 2 ....

....

[2]

Question 2 continues on the next page.

(c) Anna has to send an email to Bob containing confidential information. Bob ~~ never sent emails to each other before.

Bob and Anna both have public and private keys.

The first step is for Anna to request that Bob sends her one of his keys.

(i) State the key that Bob sends. ....[1]

(ii) Explain how Anna can be sure that it is Bob who has sent the key.

....

....

....

....[2]

(iii) Anna has received the key from Bob.

The following incomplete table shows the sequence of actions between Anna and Bob to communicate the confidential information.

Complete the table.

The person performing the action	What that person does
Anna	Requests Bob's <answer to **part (c)(i)**> key.
Bob	....
Anna	....
Anna	Sends the email to Bob.
Bob	....

[4]

Question 3 begins on page 8.

QUESTION 5.

2 The following incomplete table shows descriptions and terms relating to malware.

(a) Complete the table with appropriate description and terms.

	Description	Term	
(i)	Malicious code is installed on a personal computer so that the user is misdirected to a fraudulent web site without their knowledge.	....	[1]
(ii)	An attempt to acquire sensitive information, often for malicious reasons, by trying to deceive the user through the contents of an email.	....	[1]
(iii)	....	Worm	[2]

(b) State **two** vulnerabilities that the malware in **part (a)(i)** or **part (a)(ii)** can exploit.

Vulnerability 1 ....

....

Vulnerability 2 ....

....

[2]

(c) Digital certificates are used in internet communications. A Certificate A responsible for issuing a digital certificate.

The digital certificate contains a digital signature produced by the CA.

(i) Name **three** additional data items present in a digital certificate.

1 ....

2 ....

3 ....
[3]

(ii) Describe how the digital signature is produced by the CA.

....

....

....

....

....

....[3]

(iii) Give the reason for including a digital signature in the digital certificate.

....

5 **(a)** Wiktor is an employee of a travel agent. He uses asymmetric encryption to ⸱
information to his manager.

Fill in the spaces with an appropriate term to complete the descriptions.

Asymmetric encryption uses different ……………………………. for encrypting and decrypting

data. When Wiktor sends a message to his manager, the message is encrypted into

……………………………. using his manager's ……………………………. key. When the

manager receives the message, it is decrypted using her ……………………………. key.

When the manager replies, the message is encrypted using Wiktor's …………………………….

key, and when Wiktor receives the message, it is decrypted into …………………………….

using his ……………………………. key. [5]

(b) When customers pay for their travel booking online, a secure connection is established using
Secure Socket Layer (SSL).

Explain how the customer's browser and the server used to collect the payment will establish
a secure connection.

....

....

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....

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....

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....

....

....

....

.... [6]

(c) The manager is concerned about the threat of malware to the company com

Name **two** types of malware. State what the company should do to help prevent t the malware.

The two methods of prevention must be different.

Malware type 1 ....

Prevention ....

....

Malware type 2 ....

Prevention ....

....

[4]

5 Sanjeet is a member of the public, and he wants to send a private message ... department.

(a) Explain how asymmetric encryption is used to ensure that the message remains priv...

....

....

....

.... [2]

(b) When the government department replies to Sanjeet, it needs to send a verified message.

Explain how asymmetric encryption can be used to ensure that it is a verified message.

....

....

....

....

....

.... [2]

(c) The government's computer systems are vulnerable to malware.

(i) Describe **two** vulnerabilities that malware can exploit in computer systems.

1 ....

....

....

....

2 ....

....

....

....
[4]

(ii) Identify **one** method that can be used to restrict the effect of malware.

....

.... [1]