Chhetri Academy

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GCSE COMPUTER SCIENCE

1.4

OCR J277 | Specification point 1.4.1

Threats to computer systems and networks

Untiered

Past paper question booklet

4	2018-2023	Untiered
question groups	available papers	tier

Before you begin

1. Show working and use units where appropriate.
2. Use extra paper if you need more space.
3. Print at actual size (100%) for measurement questions.

Name _____ **Date** _____

Whole questions are retained for context; some parts cover other points. Legacy sources are labelled.

2 A house has computers in each room and a central router. Every room allows both Ethernet and WiFi connections to the router.

(a) Identify if the house network is a LAN (local area network) or a WAN (wide area network). Justify your choice.

Network type: .....

Justification: .....

.....

.....

.....

[3]

(b) The following table has descriptions of Ethernet and WiFi.

Tick (✓) **one** box in each row to identify if the description is more appropriate for Ethernet or WiFi.

Description	Ethernet	WiFi
A wired connection		
More likely to be affected by interference		
Data can be transmitted at a faster speed		
Wireless transmission		
Shorter transmission range before data is lost		

[5]

(c) **(i)** Describe the purpose of the router in the house's network.

.....

.....

.....

..... **[2]**

(ii) Identify **two** additional items of network hardware, apart from cables and a router, that may be used within the house network.

1 .....

2 .....

[2]

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Turn over

(d) A user enters a uniform resource locator (URL) into a web browser on one of the computers in the house. A system is then used to find the IP address of the web server associated with the URL.

(i) Name the system which matches URLs to IP addresses on the web.

.....

..... **[1]**

(ii) The following statements describe what happens after the IP address has been found and returned to the user's computer.

There are **five** missing statements in the table.

Write the letter of the missing statements from the table in the correct place to complete the description.

1 The request is put into packets

2 .....

3 The packets are sent across the network

4 .....

5 .....

6 If they have not arrived:

7 A timeout is sent to request the packets are resent

8 If they have arrived:

9 .....

10 .....

Letter	Statement
A	The server checks if all the packets have arrived
B	The packets are put in order
C	The request is processed by the web server
D	The packets are received by the host server
E	Each packet is given the address and a number

[5]

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(e) The house owner is concerned about potential threats to the network from being connected to the Internet.

(i) Describe **three** possible threats to the computers connected to the network and give **one** way each threat can be reduced or prevented.

Threat 1 .....

.....

.....

.....

Prevention .....

Threat 2 .....

.....

.....

.....

Prevention .....

Threat 3 .....

.....

.....

.....

Prevention .....

[9]

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1 Data in computer systems is valuable and at risk of loss, damage or being stolen.

(a) The table has four potential threats to data.

Write one prevention method for each threat in the table. Each prevention method must be different.

Threat	Prevention method
Unauthorised access to computer	
Virus	
Phishing	
Data interception	

[4]

(b) Name **two** other threats to the data in a computer system and give a method of preventing each.

Threat 1 .....

Prevention 1 .....

.....

Threat 2 .....

Prevention 2 .....

.....

[4]

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7 A university has buildings in two sites that are 5 miles apart.

(a) Describe the difference between a LAN and a WAN.

.....

.....

.....

..... **[2]**

(b) Site A has 4 classrooms. Site B has 2 classrooms. The network on each site between the classrooms is a star topology using a switch. The two sites are connected over the Internet.

Complete the network diagram for **site A** of the University.



[2]

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(c) Site B has a higher network performance than site A.

(i) Explain how each of the following can contribute to the performance of a network.

Wifi frequency .....

.....

Interference .....

.....

Number of concurrent users .....

.....

Type of network traffic .....

..... **[4]**

(ii) Identify **one** other factor that can contribute to the performance of a network.

.....

..... **[1]**

(iii) The data transmitted between the two sites uses packet switching. Data is transmitted from a computer in site A to a computer in site B.

Describe how packet switching can be used when sending data from one site to the other.

.....

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.....

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.....

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.....

.....

..... **[4]**

(d) The university want to protect their data against threats when connected to the Internet.

(i) Describe the threat malware can pose to the university's network and give a prevention method that the university can use.

Description .....

.....

.....

.....

Prevention .....

.....

[3]

(ii) Describe the threat a brute force attack can pose to the university's network and give a prevention method that the university can use.

Description .....

.....

.....

.....

Prevention .....

.....

[3]

(e) Data transmitted over the network uses different protocols.

Tick **one** box in each row to identify whether the protocol is related to email, transferring files or accessing websites.

Protocol	Email	Transferring files	Accessing websites
POP			
FTP			
SMTP			
HTTPS			

[4]

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(f) The building is considering the implementation of a virtual network.

Describe what is meant by a virtual network.

.....

.....

.....

..... **[2]**

4 **(a)** Tick (✓) **one or more** boxes on each row to identify all of the methods that can help to prevent each threat.

Threat	Anti-malware	Penetration testing	Encryption	Firewall
Spyware				
Brute-force attack				
Data interception				
SQL injection				

[4]

(b) Name **and** describe **one** threat to a computer system that is not given in **question 4(a)**.

Threat .....

Description .....

.....

.....

.....

[3]