Chhetri Academy

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GCSE COMPUTER SCIENCE

1.4

OCR J277 | Specification point 1.4.2

Identifying and preventing vulnerabilities

Untiered

Past paper question booklet

4	2015-2023	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.

4 Security on a computer can be provided directly by the operating system or by using utility programs.

(a) Utility programs include antivirus, file transfer, firewall and system cleanup.

State which **two** of these utilities can be used for security.

1 .....

2 .....

[2]

(b) Identify and describe **two** methods by which the operating system can provide additional security directly.

1 .....

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.....

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2 .....

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.....

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[4]

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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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..... **[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.

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.....

.....

..... **[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 .....

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.....

.....

[3]