

CAMBRIDGE TECHNICALS LEVEL 3 (2016)

Examiners' report

IT

05838–05842, 05877

Unit 3 Summer 2024 series

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Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates.

The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions and highlight good performance and where performance could be improved. A selection of candidate answers is also provided. The reports will also explain aspects which caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

Where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.

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Unit 3 series overview

This unit is mandatory for the Extended Certificate, Diploma and Extended Diploma and optional for all pathways for the Introductory Diploma and Foundation Diploma.

The unit focuses on:

- An understanding of cyber security and the issues surrounding it
- Measures that can be used to protect against cyber security incidents
- An understanding of how to manage cyber security incidents.

The paper is divided into two sections – A and B. Section A is worth 60% (40 marks) and are based around a pre-release scenario. The pre-release contains areas for further research that the candidate is expected to undertake and which form the basis of the questions to be asked. Section B is worth 40% (20 marks) and each question has its own short scenario

Candidates who did well on this paper generally:	Candidates who did less well on this paper generally:
<ul style="list-style-type: none">• Used technical terms• Related their answers to the scenario in the question• Used the keywords in the question to give appropriate depth to their response• Learn the key definitions from the specification	<ul style="list-style-type: none">• Answered the question they thought was being asked, not the one actually being asked• Repeating the same point several times in different ways• Giving an answer that has been eliminated in the question

Section A overview

The pre-release identifies key research topics that the candidates should have spent some time working on. They need to have cross-referenced the topics against the specification. The pre-release material assists the candidates in what to study and can be used to give an insight into the answers to certain questions.

Question 1 (a) (i)

1

(a) One of the aims of cyber security is to protect information by making sure information has confidentiality, integrity and availability.

(i) Describe **availability** of information.

.....

.....

.....

..... [2]

The CIA triad is central to an understanding of cyber security and it was disappointing that many candidates confused confidentiality and availability, choosing to focus their response on protecting the information rather than accessing it. This was a learnt response of a core definition and should have been two nice marks for the candidate to start the paper with.

Question 1 (a) (ii)

(ii) Give **one** example of a **cyber security measure** Charlie can use to protect the availability of their information.

.....

..... [1]

Candidates who gave answers in Question 1 (a) (i) that related to the confidentiality of the information continued here by giving security measures that matched – passwords for example or encryption which do not have anything to do with availability.

Question 1 (b)

- (b) One of the threats to cyber security is environmental.

Identify one **environmental** threat and describe how Charlie's network is vulnerable to it.

Environmental threat

.....

Description

.....

[2]

The pre-release contained a very clear environmental factor and it was pleasing that some candidates had obviously put the work into analysing it prior to the examination and identified fire and overloaded plug sockets. For some, environmental was an unknown quantity even though a research point was to consider the 'types of cyber security incidents'.

Question 2 (a)

2

- (a) Charlie suspects the teenager who lives on the other side of the street has hacked into their network.

One motivation for the teenager is thrill seeking.

Identify **two other** motivations for the teenager to hack into Charlie's home network.

Motivation 1

.....

Motivation 2

.....

[2]

Motivations of the different types of attackers was another research point. Many candidates did 'hone in' on the use of premade scripts and lack of experience but a considerable number confused motivations and characteristics losing marks.

Question 2 (b)

(b) After doing some research, Charlie believes that the teenager is a script kiddie.

One characteristic of a script kiddie is that they are likely to be a teenager.

Identify **two other** characteristics of a script kiddie.

Characteristic 1

.....

Characteristic 2

.....

[2]

The question stem identified the attacker as a script kiddie and a teenager. A number of candidates either did not read this, or were unaware of what a teenager was, giving a characteristic as the age being between 13 and 18. For those who had done the research, use of premade scripts and inexperience were often seen correct answers.

Question 2 (c)

(c) Identify **two other** types of attacker who might have hacked into Charlie's network.

1

.....

2

.....

[2]

This was a learnt response based on the list of attackers in the specification. 'Hackers' is not an acceptable response, even if white, black, or grey is placed in front of it.

Misconception



The word 'hacker' is a generic term and not one that is included in the list in the specification or that gains marks when candidates are asked to identify a type of attacker.

Question 3 (a) (i)

3

(a) Following the hack on their network, Charlie discovers that some files cannot be opened.

(i) Identify and describe the **type of cyber security incident** that has occurred.

Type of incident

.....

Description

.....

[2]

The types of incidents are listed in the specification and are very specific. This was a learnt response – could the candidate identify the type of incident from the example of use. In many cases, the answer was unfortunately no, with candidates giving alternative scenarios including ransomware as a virus attack to account lockout.

Question 3 (a) (ii)

(ii) Charlie has found some of their personal information posted to a local neighbourhood website.

Identify and describe the **type of cyber security incident** that has occurred.

Type of incident

.....

Description

.....

[2]

As with Question 3 (a) (i), this was poorly answered with candidates not having learnt the types of incidents listed in the specification.

Question 3 (b)

- (b) The disruption to Charlie's life caused by the attack on their network includes loss of privacy, financial and reputational damage.

Explain **two other** ways Charlie's life could have been **disrupted** by the attack on their network.

Way 1

.....

.....

Way 2

.....

.....

[6]

There were many good answers seen here which focused on a variety of topics including job loss, mental health, identity theft and accessibility of files. Many candidates were able to identify ways in which Charlie's life had been disrupted but few were able to expand their answers to include an explanation of how.

Candidates who did not score highly did so because they gave disruptions based on finance, privacy or reputation – all areas excluded by the question.

Question 4 (a)*

4

(a)* The ethical impacts on Charlie of being attacked include loss of privacy, financial and reputational damage.

Discuss the **ethical impacts** of loss of privacy, financial and reputational damage on Charlie.

.....

.....

.....

.....

.....

..... [7]

There are two essays in the paper, one worth 7 marks and one worth 10 marks. These are marked using a Level of Response mark scheme rather than point marked with the levels being determined by the depth of the candidate's response. It is easier to view these as a collection of explanations as each point needs to be in the same depth as an isolated explanation.

Exemplar 1

The impact of loss of privacy on Charlie could be the hacker finding his health record. This could be used to lower his position in the company. Something like this could be done by another employee that wants your position. Financial damage refers to Charlie losing an amount of money. The hacker could possibly get Charlie's financial information and steal money from him & take out huge bank loans in Charlie's name. This would leave Charlie in debt with the bank and because his money was stolen he may not be able to pay for everyday things eg car insurance. Charlie's reputation could be damaged because businesses will see him as unreliable because he did not have enough security to prevent him from getting hacked. Many businesses would not want someone like that hence he may lose his job.

As can be seen in the script here, the candidate has identified and described impacts relating to privacy (health records being shown), financial (taking out bank loans) and reputation (losing job). However, in each of the examples there is no depth to the responses – they are descriptive only which limits them to a maximum of 5/7.

Question 4 (b)

- (b) Charlie decides to take an online course in cyber security.

One of the modules is about vulnerability testing.

Describe the following vulnerability testing techniques.

Penetration testing

.....

.....

Sandboxing

.....

.....

[4]

Penetration testing was generally well-known; with sandboxing, less so.

Question 4 (c)

- (c) Explain why fuzzing would **not** be an appropriate vulnerability technique for Charlie to use on their network.

.....

.....

.....

.....

.....

..... [2]

This was poorly done with many candidates not knowing what fuzzing was. A large number of candidates gave answers related to the size of the network but many responses were based on guessing and achieved no marks.

Question 4 (d)

(d) Explain **three** ways Charlie can mitigate the risk of a future attack on their network.

1

.....

.....

.....

2

.....

.....

.....

3

.....

.....

.....

[6]

This question was generally well done with many candidates coming up with suggestions that could be implemented by Charlie. Firewall and antivirus were common answers and a few candidates used the case study to suggest answers based on extension leads, blinds and changing passwords. Encryption was the most common incorrect answer as this does not mitigate the attack, just what the attacker can do once the data has been obtained.

Section B overview

This section is not based on the pre-release material. There is a stem to the section and candidates are expected to use it, where appropriate, within their responses.

Question 5 (a)

A company has implemented a set of procedures to improve the security of its network and started to use cryptography to protect valuable documents.

When starting work on a Monday morning, the company was surprised to discover that it had been the victim of a ransomware attack.

- 5
- (a) Explain why the company's reliance on **procedures and cryptography** has led to an incorrect view that its systems were safe.

.....

.....

.....

.....

.....

..... [6]

Many candidates found this question difficult and struggled with it. There was a large proportion of students who identified, and went on to describe, other methods that the company should have been using – they did not focus on the shortcomings of procedures or cryptography. Candidates who did, generally did better on procedures and gained marks.

Exemplar 2

As cryptography is about protecting open and closed networks ~~open~~ However can give false information as it cannot protect a lot of information as both closed and open information.

Procedure can help ~~use~~ the company monitor and protect the network however if any steps of the procedure is missed then it could lead to network being easy to hack. There are also other ways of an attack e.g. an insider. [6]

As can be seen in the script here, cryptography is not well known but the candidate has identified a shortcoming in the use of procedures. They have also identified a general argument against most types of security – the attack by the insider.

Question 5 (b)

(b) Describe **two** actions the company could take to **eradicate the incident**.

Action 1

.....

.....

.....

Action 2

.....

.....

.....

[4]

Many candidates correctly identified actions for eradicating the incident and thus scored well – the most common ones being to pay the ransom, install anti virus in the hope it would remove the ransomware and employ a third party.

Candidates who described preventative measures for future attacks did not score any marks. The question was about the current incident and eradication is one of the steps listed in the specification related to responding to the current incident.

Question 5 (c)*

(c)* The company is completing a Cyber Security Incident Report (CSIR).

One of the sections relates to the **impact of the incident on business, data and recovery time**.

Explain how this section of the CSIR would be used by the company.

.....

.....

.....

.....

.....

..... [10]

Candidates who scored above the first level of response in this question were able to explain how the company would use this section of the CSIR relating to business impacts, data impacts, and recovery time with good examples.

Most candidates identified how a company would use the sections – most notable in recovery and prevention but as there was no depth or detail to their answers, they failed to score more than 3. Candidates who explained how a company would complete the CSIR rather than how it would use the CSIR did not gain any marks.

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