CAMBRIDGE ADVANCED NATIONALS

OCR
Oxford Cambridge and RSA

Sample assessment material

LEVEL 3 ALTERNATIVE ACADEMIC QUALIFICATION
CAMBRIDGE ADVANCED NATIONAL IN

COMPUTING: APPLICATION DEVELOPMENT

Extended Certificate H129

For first teaching in 2025

F161: Developing application software

Version 1.0 (June 2024)

Introduction

This is Sample Assessment Material (SAM) which has been produced for the OCR Level 3 Alternative Academic Qualification Cambridge Advanced National in Computing: Application Development (Certificate) and the OCR Level 3 Alternative Academic Qualification Cambridge Advanced National in Computing: Application Development (Extended Certificate).

The SAM is an example exam paper that we publish alongside a new specification to help illustrate its intended style and structure when a qualification is first launched. We wanted to share the story of our assessment approach with you so when you look through the paper you will find we have pointed out certain features and explained the decisions we have made.

Resources to help support in teaching different areas of content can be found on the OCR Level 3 Alternative Academic Qualification Cambridge Advanced Nationals in Computing: Application Development webpage under 'Planning and teaching '.

Our exam papers are developed with accessibility in mind. The Understanding the assessment guide tells you a little more about the principles and rationale underpinning our approach for the qualifications. The 'Command Words' are in both the Understanding the Assessment guide and the specification. These tell you what we mean by each command word and how students should approach the question and understand its demand.

Appendix B of the specification: Command Words, gives detail about what is expected of each command word that will be included in exams and mark schemes. You can include teaching around the expectations of these as part of your teaching.

You said, we did

During the development of these qualifications, we talked extensively with teachers, subject experts, higher education institutions and our senior assessment teams to influence their structure, content and assessment materials. We then shared our final materials with teachers to make sure that they met their needs.

You told us that you wanted the exam to take similar approaches to the exam in the current Cambridge National in Information Technology qualification. We have tried to do this by using a familiar tone and style of questioning.

You told us to keep this exam as short as possible but retain time to allow students to read the scenario and respond to questions. We have done this by reducing the number of available marks to 60 and setting this exams duration to 1 hour 15 minutes.

You told us that you wanted the exam to be based on a single context, that develops through the paper, so that is what we've done.

You told us that scenarios used in the exam should be accessible and easy for students to understand. We have done this by only using scenarios with things that students will have encountered.

Examples of comments received are placed against the relevant sections/questions.

All students will sit the exam at the same time on the same day.

The time allowed is designed to give students approximately one minute per mark plus reading time.

If students require additional space to write their response(s), lined paper may be available at the end of the exam paper in a live exam. Remember the question number(s) **must** be clearly shown.

OCR
Oxford Cambridge and RSA

<<Date>> – <<Morning/Afternoon>>

Level 3 Alternative Academic Qualification Cambridge Advanced National in Computing: Application Development

H129 Unit F161**:** Developing application software

Sample Assessment Material (SAM)

Time allowed: 1 hour 15 minutes

No extra materials are needed.

Please write clearly in black ink. **Do not write in the barcodes.**

Centre number | Candidate number

First name(s)

Last name

Date of birth (D D M M Y Y Y Y)

INSTRUCTIONS

- Use black ink.
- Write your answer to each question in the space provided. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- In the live exam there might be lined pages at the end of the question paper for you to use if you need extra space. Remember, you must clearly show the question numbers.
- Answer **all** the questions.

INFORMATION

- The total mark for this paper is **60**.
- The marks for each question are shown in brackets **[ ]**.
- This document consists of **12** pages.

ADVICE

- Read each question carefully before you start your answer

This unit is part of the Extended Certificate qualification. It is **not** included in the Certificate qualification.

This exam will always be set and marked by us. Exams will be available in January and June each year. Students can resit this unit and the best result will be used to calculate the certification result.

The exam will always have 60 marks. There are no sections in this exam.

This exam will have between nine and eleven mandatory questions. Question types include:

- Forced choice/controlled response questions. These are typically worth 1 to 4 marks.
- Short answer, closed response questions. These are typically worth 1 to 4 marks.
- Extended constructed response questions with points-based marks schemes. These are typically worth 1 to 4 marks.
- Extended constructed response questions with levels of response marks schemes. These are typically worth 6 or 9 marks.

These allow us to assess the following Performance Objectives:

- PO1 – Show knowledge and understanding
- PO2 – Apply knowledge and understanding
- PO3 – Analyse and evaluate knowledge, understanding and performance.

The questions will sample content from across all Topic Areas. At least one question (or sub-part) will relate to each Topic Area. Sub-content topic areas will be sampled across exam papers, over time.

1 An application is being developed to help primary school students with their maths. The application will be accessed through a website both in school and remotely.

(a) Explain **one** advantage and **one** disadvantage to a user of accessing an application through a website.

Advantage .....

.....

.....

.....

Disadvantage .....

.....

.....

.....

[4]

(b) Students could use a desktop device when accessing the maths application.

Identify **two** characteristics of desktop devices that make them suitable to access applications.

1 .....

2 .....

[2]

All questions in this exam will relate to a single scenario. The scenario will always be introduced at the start of this exam and will develop throughout.

This is an example of a 4 mark **explain** question. 2 marks are available for each advantage and disadvantage explained. 1 mark is for identifying a valid advantage/disadvantage and the 2nd is for saying how the advantage/ disadvantage affects a user accessing an application through a website. This question assesses PO1 (show knowledge and understanding).

The number of points needed will always be **emboldened**.

The number of marks for each question will always be given at the end of the question and will always be right aligned.

3

(c)
(i) Identify **one** device that students could use to access the maths application at home other than a desktop device.

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

(ii) Explain why the device you have chosen in **1(c)(i)** is suitable to access the maths application at home.

.....

.....

.....

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

2 The website and maths application will be stored in a private cloud. To access the private cloud, schools need to register and pay a subscription. When the subscription has been paid, schools receive a school username and auto-generated password. Each teacher and student will have their own log-in details to access the application. Students can be added or removed at any time during the subscription.

Explain **one** advantage and **one** disadvantage to schools of the maths application being stored in a private cloud.

Advantage.....

.....

.....

.....

Disadvantage.....

.....

.....

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

Where a response must relate to a response given in another question, this will be clearly indicated.

The scenario will develop throughout this exam.

Where a question asks students to **explain**, they must show (PO1) or apply (PO2) their understanding.
It is **not** enough to recall or apply knowledge alone.

This is an example of an extended constructed response question. Students will provide a shorter style extended response.

We will use extended constructed response questions to assess a range of performance objectives. They will enable students to show and/or apply knowledge and understanding.

Where a question asks specifically for an advantage and a disadvantage, we will always put headings against the lines to show where students should write their response.

3 The maths application will use the JavaScript Object Notation (JSON) data format.

(a) State **two** characteristics of JSON.

1 .....

2 .....

[2]

(b) Describe how JSON could be used in the maths application.

.....

.....

.....

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

(c) When students are using the maths application, the data will be in the state of **in transit**.

State **two** characteristics of **data in transit**.

1 .....

.....

2 .....

.....

[2]

(d) Describe how the integrity of the data used in the maths application could be maintained when using Transport Control Protocol (TCP) during transit.

.....

.....

.....

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

When a question assesses PO1 (show knowledge and understanding) student responses do **not** need to be applied to the scenario. The question wording will always indicate when a question assesses PO1.

When a question assesses PO2 (apply knowledge and understanding) student responses **must** be applied to the scenario. The question wording will always indicate when a question assesses PO2.

This **state** question assesses PO1 (show knowledge and understanding).

Key words will be emboldened.

In this question, students need to apply their understanding (PO2) by describing how TCP is used in the maths application to maintain the integrity of data.

Where context is given, this will be kept as short as possible and will only include information needed for the questions

4

(a) Students will be provided with access details for the maths application by their school. When the access details are input, students gain access to their progress saved on the maths application. Students will also need to input data when they answer questions in the maths application.

(i) Identify **one** data input that could be entered into the maths application.

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

(ii) Describe how the data input you have chosen in **4(a)(i)** will be used in the maths application.

.....

.....

.....

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

(b) The maths application will store the contact details of each school.

(i) Identify the Act that the developers must comply with.

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

(ii) Explain the purpose of the Act identified in **4(b)(i)**.

.....

.....

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

This **identify** question assesses PO2 (apply knowledge and understanding). Student responses **must** be applied to the scenario.

5 The maths application will include an Application Programming Interface (API).

(a) What is the role of an API?

.....

.....

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

(b) Analyse the advantages for developers of using the private API type when developing the maths application.

.....

.....

.....

.....

.....

.....

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.....

.....

.....

.....

.....**[6]**

This is an example of an **analyse** question. The question is assessing PO3 (analyse and evaluate knowledge, understanding and performance).

The number of lines given for a question indicate the approximate length of the response required.

This exam will have one level of response (LOR) question worth 6 marks. This needs an extended written response. This question will assess PO3 (analyse and evaluate knowledge, understanding and performance) and responses will need to include analysis. The question topic may be drawn from any relevant aspect of the unit's teaching content.

Extended response questions give students a real opportunity to show the extent of their knowledge and understanding of the subject.

Where an acronym is first used in the scenario or question, we will always expand it and give the acronym in brackets afterwards. Then only the acronym will be used.

Where a student's response finishes a sentence or statement, it will always be shown like this. Students could also be asked to complete a table or diagram.

In this question, students need to show their understanding (PO1) by explaining how a firewall reduces the threat of a DDoS on a website hosting an application.

This question refers to hosting an application generically, rather than specifically hosting the maths application. The question assesses PO1 (show knowledge and understanding). The student response will **not** need to be applied to the scenario.

6 Teachers will need to enter their access details to begin using the maths application. The digital security mitigation of Two-Factor Authentication (2FA) will be used to maintain the security of the maths application.

Explain why 2FA should be used to maintain the security of the maths application.

.....

.....

.....

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

7 One threat to the website hosting the maths application is a Distributed Denial of Service (DDoS).

(a) Complete the sentence to explain how a DDoS can threaten a website.

A DDoS is an attempt to make a website unavailable to authorised users by _____ it

with useless _____ traffic from a range of different systems and locations.

[2]

(b) The website hosting the maths application will be protected by a firewall.
Explain how a firewall reduces the threat of a DDoS on a website hosting an application.

.....

.....

.....

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

Short answer, closed response questions and extended constructed response questions test knowledge and understanding from across the unit's content and allow students the opportunity to give free responses.

8 The maths application will be offered to schools as a stand-alone application. The stand-alone application will need to be tested before being released to schools. Normal and erroneous test data will be used during the testing.

(a)

(i) What is **normal** test data?

.....

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

(ii) Explain **one** way normal test data could be used to test the stand-alone maths application.

.....

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

(iii) What is **erroneous** test data?

.....

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

This is an example of a 1 mark **explain** question. The mark is for a valid way explained.

(iv) Explain **one** way erroneous test data could be used to test the stand-alone maths application.

.....

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

This is an example of a **discuss** question. The question is assessing PO3 (analyse and evaluate knowledge, understanding and performance).

9

(b) Discuss whether the developers should complete technical testing on the stand-alone maths application.

In your answer you **must** write about:

- The **advantages to the developers** of completing technical testing
- The **disadvantages to the developers** of completing technical testing
- Whether you would recommend that the developers complete technical testing **and** your reasons.

[9]

This exam will have one level of response (LOR) question worth 9 marks. This needs an extended written response. This question will assess PO3 (analyse and evaluate knowledge, understanding and performance) and responses will need to include discussion. The question topic may be drawn from any relevant aspect of the unit's teaching content.

Extended response questions give students a real opportunity to show the extent of their knowledge and understanding of the subject.

Turn over

Appendix B in the **Specification** contains a glossary of **Command Words** which could be used in this exam. The glossary tells you what we mean by each command word.

9

(a) A user guide will be created for the stand-alone maths application. The user guide will need to include the maths application's technical requirements.

(i) Identify **one** example of a technical requirement for the maths application.

.....

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

(ii) Explain why the technical requirement you have chosen in **9(a)(i)** should be included in the user guide.

.....

.....

.....

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

(b) Explain **two** advantages to schools of the stand-alone maths application being installed as a cloud download.

Where a question asks for a specific number of points, we will always put numbers or response headings against the lines to show where students should write each point of their response.

1 .....

.....

.....

.....

2 .....

.....

.....

.....

[4]

This is an example of a 4 mark **explain** question. 2 marks are available for each advantage explained. 1 mark is for identifying the advantage and the 2nd mark for saying how the advantage benefits schools. This question assesses PO2 (apply knowledge and understanding). Student responses **must** be applied to the scenario.

11

(c) Identify **one other** type of application software installation that could be used other than a cloud download.

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

END OF QUESTION PAPER

This indicates to students there are no more questions to answer.

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