



Oxford Cambridge and RSA

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

H029/H129 Unit F160: Fundamentals of application development

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

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Candidate number

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First name(s)

Last name

Date of birth

D	D	M	M	Y	Y	Y	Y
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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 **16** pages.

ADVICE

- Read each question carefully before you start your answer.

1 Progress Walk is developing a smartphone health application to encourage adults to exercise by walking around their local town instead of driving. They will call their application ProgressWalk.

(a) Outline **two** characteristics of an application.

1

.....

2

.....

[2]

(b) Complete the table to match the correct application software category to each characteristic.

Write the name of **one** application software category in each of the **two** spaces in the table.

Application software categories:

Embedded

Freeware

Open

Shareware

Characteristics of application software categories	Application software category
Specialised for a particular device or machine that may not be considered as a computer.	
Developer retains the right to control, distribute modify and sell the software.	

[2]

(c)

(i) Identify **one** type of operating system that the ProgressWalk application could run on.

.....[1]

(ii) Explain **one** reason why the type of operating system you have chosen in **1(c)(i)** is suitable for the ProgressWalk application.

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

2

(a) Players will score points when using the application. Players can exchange their points for healthy food and drink in local shops. Players will be able to compete and share their progress with their peers and monitor their weekly scores.

(i) Identify **one** application type that the ProgressWalk application could be included in.

.....[1]

(ii) Describe the purpose of the application type you have chosen in **2(a)(i)**.

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

(iii) Explain **one** reason why the application type you have chosen in **2(a)(i)** is appropriate for the ProgressWalk application.

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

(b) The application will be a bespoke application

What is a **bespoke application**?

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

3

(a) The ProgressWalk application will require players to set up an account linked to their email. Players will receive a confirmation email to verify the account and vouchers for signing up.

Once they are logged into their account on the application, players can set permissions and personalise their settings. The look of the application will need to follow the ProgressWalk house style but will allow players to add an avatar and change the colour of the menu.

The application will work on smart phones and allow players to input information using the camera and touchscreen keyboard. The application always requires access to the players' location so that that their movement can be tracked. Players will score points by uploading photos of themselves outside local buildings with the GPS coordinates attached.

Explain **two** functional requirements for the new application.

1

.....

.....

.....

.....

2

.....

.....

.....

..... [4]

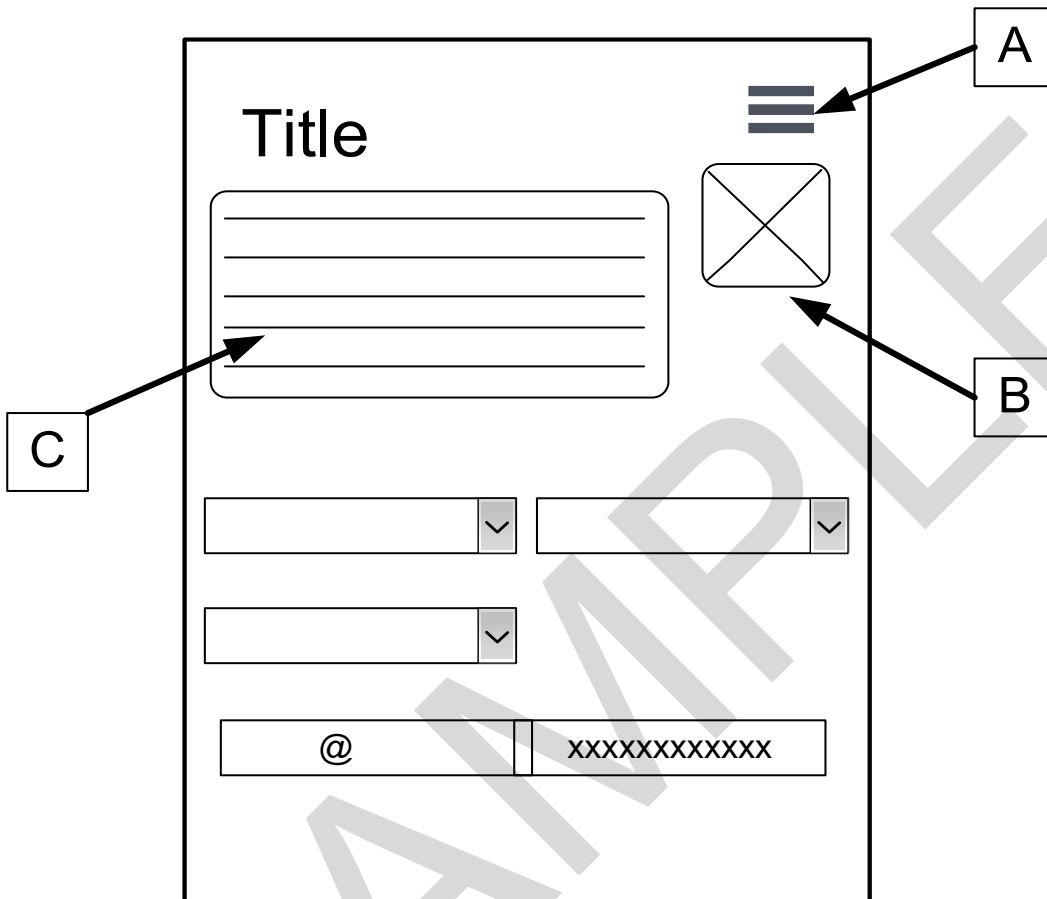
PLEASE TURN OVER FOR QUESTION 7

SAMPLE

7 Players will score points by uploading photos of themselves outside local buildings. Players can add text to the images. The images can also be posted on players' personal social media accounts.

(a)

(i) This is a wireframe of the main screen human computer interface.



Complete the table using the letters (A-C) from the wireframe.

Wireframe component	Letter
Text box	
Image	
Menu	

[3]

(ii) Explain **two** ways that the effectiveness of the human computer interface in 7(a)(i) could be improved.

1

.....

.....

.....

2

.....

.....

..... [4]

(b) Describe **two** types of interaction that can be used with the human computer interface.

1

.....

.....

.....

2

.....

.....

.....

[4]

(c) Identify **two** ways error messages can help players use ProgressWalk application’s human computer interface.

1

.....

2

..... [2]

8 Describe **two** characteristics of a smartphone that make it suitable for use with the ProgressWalk application.

1

.....

.....

.....

2

.....

.....

..... [4]

9 The wireframe will be used by a User Interface Designer (UID) to gather feedback from ProgressWalk.

(a) Explain **one** way the UID can use verbal communication skills to gather feedback about the wireframe.

.....

.....

.....

..... [2]

(b) Describe **one** responsibility of a UID, other than gathering feedback.

.....

.....

.....

..... [2]

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Oxford Cambridge and RSA

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

**Unit F160 – Fundamentals of application development
Sample Assessment Material (SAM)**

Mark scheme

This document has **13** pages.

MARKING INSTRUCTIONS

Crossed-out answers

If a student has crossed out an answer and written a clear alternative, do **not** mark the crossed-out answer.

If a student has crossed out an answer and **not** written a clear alternative, give the student the benefit of the doubt and mark the crossed-out answer if it's readable.

Multiple choice question answers

When a multiple choice question has only one correct answer and a student has written two or more answers (even if one of these answers is correct), you should **not** award a mark.

When a student writes more than one answer

1. Questions that ask for a set number (including 1) of short answers or points

If a question asks for a set number of short answers or points (e.g. **two** reasons for something), mark only the **first set number** of answers/points.

First mark the answers/points against any printed numbers on the answer lines, marking the **first** answer/point written against each printed number. **Then**, if students have not followed the printed numbers, mark the answers/points from left to right on each line and **then** line by line until the set number of answers/points have been marked. Do **not** mark the remaining answers/points.

2. Questions that ask for a single developed answer

If a student has written two or more answers to a question that only requires a single (developed) answer, and has **not** crossed out unintended answers, mark only the first answer.

3. Contradictory answers in points-based questions

When a student has written contradictory answers, do **not** award any marks, even if one of the answers is correct.

Levels of Response marking

1. To determine the level start at the highest level and work down until you reach the level that best describes the answer

2. To determine the mark within the level, consider the following:

Quality of the answer	Award mark
Consistently meets the criteria for this level	At the top of the level (6 and 9 mark questions)
Meets the criteria but with some inconsistency	At the middle of the level (9 mark questions)
On the borderline of this level and the one below	At the bottom of the level (6 and 9 mark questions)

ANNOTATIONS

Annotation	Meaning

MARK SCHEME

1a	
Max mark	2 (PO1)
Answer	Any two marks from: <ul style="list-style-type: none"> • Computer software designed to meet the specific requirements of a user. (1) • A computer program designed to perform specific tasks. (1) • Computer software designed to run on a specific operating system. (1) Credit any other appropriate response
Guidance	One mark for each correct answer. Max two marks.

1b							
Max mark	2 (PO1)						
Answer	<p>Two marks for:</p> <table border="1"> <thead> <tr> <th>Characteristics of application software categories</th> <th>Application software category</th> </tr> </thead> <tbody> <tr> <td>Specialised for a particular device or machine that may not be considered as a computer.</td> <td> <ul style="list-style-type: none"> • Embedded (1) </td> </tr> <tr> <td>Developer retains the right to control, distribute modify and sell the software.</td> <td> <ul style="list-style-type: none"> • Freeware (1) </td> </tr> </tbody> </table>	Characteristics of application software categories	Application software category	Specialised for a particular device or machine that may not be considered as a computer.	<ul style="list-style-type: none"> • Embedded (1) 	Developer retains the right to control, distribute modify and sell the software.	<ul style="list-style-type: none"> • Freeware (1)
Characteristics of application software categories	Application software category						
Specialised for a particular device or machine that may not be considered as a computer.	<ul style="list-style-type: none"> • Embedded (1) 						
Developer retains the right to control, distribute modify and sell the software.	<ul style="list-style-type: none"> • Freeware (1) 						
Guidance	One mark for each correct answer. Max two marks.						

1 c (i)	
Max mark	1 (PO2)
Answer	Any one from: <ul style="list-style-type: none"> • Proprietary operating system (1) • Open operating system (1)
Guidance	

1 c (ii)	
Max mark	2 (PO2)
Answer	<p>Up to two marks for explaining a reason. One mark for identifying a reason. One mark for saying how the reason affects the suitability, e.g:</p> <ul style="list-style-type: none"> • The ProgressWalk application will be used on a smartphone which run using proprietary software such as android (1) so the application needs to be compatible with these forms of operating system. (1) • Some smartphones are not tied to a specific system (1) so it needs to be designed for an open operating system. (1) <p>Credit any other appropriate response</p>
Guidance	<p>Up to two marks max for explaining why the operating system is appropriate. Maximum one reason. Explanation must match the answer given in 1(c)(i).</p>

2 (a) (i)	
Max mark	1 (PO2)
Answer	<p>Any one from:</p> <ul style="list-style-type: none"> • Lifestyle (1) • Education (1) • Games (1)
Guidance	

2 (a) (ii)	
Max mark	1 (PO1)
Answer	<p>One mark for the describing the purpose of the application type e.g.:</p> <ul style="list-style-type: none"> • Lifestyle <ul style="list-style-type: none"> ○ To manage a person's lifestyle (1) ○ To streamline everyday tasks (1) ○ Credit any other appropriate response • Education <ul style="list-style-type: none"> ○ To teach users about topics/issues (1) ○ To inform users about specific topics (1) ○ Credit any other appropriate response • Games <ul style="list-style-type: none"> ○ To entertain users (1) ○ To develop mental agility techniques (1) ○ Credit any other appropriate response
Guidance	<p>Up to one mark max for describing the purpose of the application type. Description must match the answer given in 2(a)(i).</p>

2 (a) (iii)	
Max mark	2 (PO2)
Answer	<p>Up to two marks for explaining a reason. One mark for identifying a reason. One mark for saying how the reason affects the appropriateness, e.g.:</p> <ul style="list-style-type: none"> • Lifestyle <ul style="list-style-type: none"> ○ To change the players habits (1) so that they lead a healthier lifestyle (1) ○ Credit any other appropriate response • Education <ul style="list-style-type: none"> ○ To teach players to be healthier (1) by getting them to be more active (1) ○ Credit any other appropriate response • Games <ul style="list-style-type: none"> ○ To motivate players to be healthier (1) by allowing them to win rewards (1) ○ Credit any other appropriate response
Guidance	<p>Up to two marks max for explaining why the application type is appropriate. Maximum one reason. Explanation must match the answer given in 2(a)(i).</p>

2 (b)	
Max mark	1 (PO1)
Answer	<p>One mark for an explanation of what bespoke application means e.g.:</p> <ul style="list-style-type: none"> • A computer program designed to meet the specific needs of a business. (1) • A computer program that is tailored to the needs and specifications of an individual user/organisation (1) <p>Credit any other appropriate response</p>
Guidance	Up to one mark max for explaining what bespoke application means.

3 (a)	
Max mark	4 (PO2)
Answer	<p>Up to two marks for each functional requirement One mark for each requirement identified One mark for saying how it meets ProgressWalks needs e.g.:</p> <ul style="list-style-type: none"> • An account needs to be created (1) allowing for reward vouchers to be distributed. (1) • The facility to upload photographs including GPS data (1) to verify the players movements/location. (1) • The application must be able to track players movements (1) so that the players walking can be monitored in the app (1) <p>Credit any other appropriate response</p>
Guidance	<p>Up to two marks max for explaining each functional requirement. Max four marks. Maximum two requirements.</p>

3 (b)	
Max mark	2 (PO1)
Answer	Up to two marks for explaining why success criteria are important e.g.: <ul style="list-style-type: none"> To provide clear expectations of what needs to be achieved (1) ensuring everybody involved within the project is on task. (1) So that progress to the desired outcome can be measured (1) allowing those involved to track the progress and make any adjustments if needed. (1) Credit any other appropriate response
Guidance	Up to two marks max for explaining why success criteria are important.

3 (c)	
Max mark	1 (PO1)
Answer	Any one from: <ul style="list-style-type: none"> Interview (1) Meeting (1) Observation Questionnaire (1) Shadowing (1) Credit any other appropriate response
Guidance	

4	
Max mark	1 (PO2)
Answer	Any one from: <ul style="list-style-type: none"> ProgressWalks' own cloud servers (1) Players' phones hosting servers (1) Credit any other appropriate response
Guidance	

5 (a)	
Max mark	2 (PO1)
Answer	Any two from: <ul style="list-style-type: none"> Allows the weaknesses of an organisation/application to be described clearly (1) Simplifies the analysis of a situation by breaking it down into four key areas (1) Allows quantitative and qualitative data to be used to assess the situation (1) Allows the threats to a project such as funding issues to be identified at the start of the project (1) Credit any other appropriate response.
Guidance	One mark for each correct answer. Max two marks.

5 (b)	
Max mark	2 (PO1)
Answer	<p>Up to two marks for explaining a disadvantage. One mark for identifying a disadvantage. One mark for saying how the disadvantage affects a development, e.g.:</p> <ul style="list-style-type: none">• Can oversimplify an issue. (1) This can lead to key aspects being missed (1)• Only having the four parts can lead to disorganisation. (1) This is because some information/data does not fit into these areas easily (1)• Credit any other appropriate response
Guidance	<p>Up to two marks max for explaining the disadvantage identified. Max one disadvantage.</p>

6	
Max mark	6 (PO3)
Answer	<p>Level 3 (high) 5-6 marks</p> <p>A thorough analysis, which includes:</p> <ul style="list-style-type: none"> • identification of a range of impacts • detailed knowledge and understanding in the context of the question • clear explanation • consistent use of appropriate subject terminology. <p>Level 2 (mid) 3-4 marks</p> <p>An adequate analysis, which includes:</p> <ul style="list-style-type: none"> • identification of some impacts • sound knowledge and understanding in the context of the question • adequate explanation • some use of appropriate subject terminology. <p>Level 1 (low) 1-2 marks</p> <p>A basic analysis, which includes:</p> <ul style="list-style-type: none"> • identification of at least one impact • limited knowledge and understanding in the context of the question • basic explanation • use of appropriate subject terminology is limited. <p>0 marks</p> <p>Answer is not worthy of credit.</p>
Guidance	<p>Indicative content.</p> <p>Answers can include some of the following:</p> <p>Examples of impacts legislation:</p> <ul style="list-style-type: none"> • Personal data being gathered when signing up • Player location being monitored • DPA needs to be adhered too • Players must be able to actively opt in and opt out of tracking/data collection • Secure storage of collected data required • Permissions for storage/use on smartphones to access images/contacts must be actively given • Ownership/copyright of uploaded images • Personal data in transit must be protected • ProgressWalk only allows access to personal data by designated individuals <p>Credit other relevant points and examples.</p>

7 (a) (i)		
Max mark	3 (PO1)	
Answer	Wireframe component	Letter
	Text box	C
	Image	B
	Menu	A
Guidance	<p>1 mark for 1 correct answer.</p> <p>2 marks for 2 correct answers.</p> <p>3 marks for 3 correct answers.</p> <p>Correct answers only.</p>	

7 (a) (ii)		
Max mark	4 (PO2)	
Answer	<p>Up to two marks for each way</p> <p>One mark for each way identified</p> <p>One mark for saying how it improves the effectiveness of the HCI e.g.:</p> <ul style="list-style-type: none"> • Prioritise the needs and preferences of the users by placing the login requirements at the top (1) so that users can log in straight away without scrolling down the screen. (1) • By using whitespace effectively so that the elements are spread out (1) to reduce the chances of the user making incorrect selections between the menu and image. (1) • Removing the use of the drop-down menus from the HCI (1) as these are hard to use on touch screen such as a smartphone. (1) <p>Credit any other appropriate response</p>	
	Guidance	<p>Up to two marks max for explaining each way. Max four marks.</p> <p>Maximum two way.</p>

7 (b)	
Max mark	4 (PO2)
Answer	<p>Up to two marks for each interaction on the human computer interface One mark for each interaction identified One mark for saying how it is used in the ProgressWalk application e.g.:</p> <ul style="list-style-type: none"> • Players will need to touch the smartphone screen (1) so that they can type their registration details using the onscreen keyboard (1) • Players will need to be swipe on the screen (1) so that they can find the correct images to upload to the application (1) • Players can use the audio facility with the microphone (1) to ask for directions when moving. (1) <p>Credit any other appropriate response</p>
Guidance	<p>Up to two marks max for describing each type of interaction. Max four marks. Max two types of interactions.</p>

7 (c)	
Max mark	2 (PO2)
Answer	<p>Any two from:</p> <ul style="list-style-type: none"> • Can inform the player when an image has not uploaded (1) • When the player is signing up the message will explain that their email address has been input incorrectly (1) <p>Credit any other appropriate response</p>
Guidance	One mark for each correct answer. Max two marks.

8	
Max mark	4 (PO2)
Answer	<p>Up to two marks for each characteristic on a smartphone One mark for each characteristic One mark for saying how it is suitable for the application e.g.:</p> <ul style="list-style-type: none"> • Smartphones have camera functions that can be used to take photographs (1) which are uploaded to show the players new location(1) • Smartphones use GPS to monitor position so that the location of the image can be verified (1) because photographs include meta data which include the GPS position (1) • Smartphones have internal storage facility (1) that allows the application to be downloaded to and installed on the phone (1) <p>Credit any other appropriate response</p>
Guidance	<p>Up to two marks max for describing each characteristic of a smartphone. Max four marks. Max two characteristics.</p>

9 (a)	
Max mark	2 (PO1)
Answer	<p>Up to two marks for how verbal communication skills can be used with the wireframe One mark for identifying the verbal communication skill One mark for saying how it used gain feedback e.g.:</p> <ul style="list-style-type: none"> • The User Interface Designer (UID) can provide more detail about the wireframe so that the people being shown it understand more about what it is doing (1). They could explain more about how the interaction of the human computer interface would work as the wireframe would not show enough detail (1) • Extra questions could be used asked by the UID when showing the wireframe to people (1) This would provide more detail about the what the view thought of the wireframe design such providing reasoning for their views on the layout of the screen (1) <p>Credit any other appropriate response</p>
Guidance	<p>Up to two marks max for explaining one way the UID could use verbal communication. Max two marks.</p> <p>Max one way.</p>

9 (b)	
Max mark	2 (PO1)
Answer	<p>Up to two marks for describing another job responsibility of a User Experience Designer e.g.:</p> <ul style="list-style-type: none"> • Review an existing application (1) and evaluate its current user experience (1) • Design the interaction flows through an application (1) so that the user has a smooth/logical experience (1) • Develop personas that can be used (1) when considering how a new application will be used/work (1) <p>Credit any other appropriate response</p>
Guidance	<p>Up to two marks max for describing one responsibility. Max two marks.</p> <p>Max one responsibility.</p>

10	
Max mark	9 (PO3)
Answer	<p>Level 3 (high) 7-9 marks</p> <p>A thorough discussion which shows detailed evaluation, which includes:</p> <ul style="list-style-type: none"> • a range of points from both sides of the argument • a detailed analysis in the context of the question • a clear conclusion(s) with detailed reasons/justifications • consistent use of appropriate subject terminology. <p>Level 2 (mid) 4-6 marks</p> <p>An adequate discussion which shows sound evaluation, which includes:</p> <ul style="list-style-type: none"> • some points from both sides of the argument • some analysis in the context of the question • an adequate conclusion(s) with relevant reasons/justifications • some use of appropriate subject terminology. <p>Level 1 (low) 1-3 marks</p> <p>A basic discussion which shows limited evaluation, which includes:</p> <ul style="list-style-type: none"> • a few points from the argument • a limited analysis in the context of the question • a brief conclusion(s) with limited reasons/justifications • use of appropriate subject terminology is limited. <p>0 marks</p> <p>Answer is not worthy of credit.</p>
Guidance	<p>Indicative content.</p> <p>Answers can include some of the following:</p> <p>Advantages of using Rapid Throwing Prototype model e.g:</p> <ul style="list-style-type: none"> • Increased speed of version development • Evolve ideas quicker • Lower labour costs/staffing • Faster decision making • Can show client versions easier/quicker • Reduced documentation <p>Disadvantages of using Rapid Throwing Prototype model e.g.:</p> <ul style="list-style-type: none"> • Can develop too many versions that are not needed • Increased costs by developing many versions • Confusion on feedback when many versions are created quickly • Lack of analysis at each stage of prototype development <p>Credit other relevant conclusions, points and examples.</p>