

LUI

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School code

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School name

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Given name/s

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Attach your  
barcode ID label here

Book

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of

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books used

External assessment 2022

Question and response book

# Digital Solutions

## Time allowed

- Perusal time — 15 minutes
- Working time — 120 minutes

## General instructions

- Answer all questions in this question and response book.
- Planning paper will not be marked.

## Section 1 (10 marks)

- 10 multiple choice questions

## Section 2 (28 marks)

- 4 short response questions

## Section 3 (31 marks)

- 1 extended response question





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**THIS PAGE WILL NOT BE MARKED**



# Section 1

## Instructions

- Choose the best answer for Questions 1–10.
- This section has 10 questions and is worth 10 marks.
- Use a 2B pencil to fill in the A, B, C or D answer bubble completely.
- If you change your mind or make a mistake, use an eraser to remove your response and fill in the new answer bubble completely.

	A	B	C	D
Example:	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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	A	B	C	D
1.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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## Section 2

### Instructions

- Write using black or blue pen.
  - If you need more space for a response, use the additional pages at the back of this book.
    - On the additional pages, write the question number you are responding to.
    - Cancel any incorrect response by ruling a single diagonal line through your work.
    - Write the page number of your alternative/additional response, i.e. See page ...
    - If you do not do this, your original response will be marked.
  - This section has four questions and is worth 28 marks.
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### QUESTION 11 (2 marks)

Explain the features of two network transmission protocols for transferring data between websites.

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## QUESTION 12 (8 marks)

Refer to Stimulus 1 in the stimulus book.

- a) Describe the listed algorithm constructs and identify one example of each from the stimulus. Use corresponding line numbers to identify examples. *[6 marks]*

Assignment: \_\_\_\_\_

\_\_\_\_\_

Example: \_\_\_\_\_

Condition: \_\_\_\_\_

\_\_\_\_\_

Example: \_\_\_\_\_

Iteration: \_\_\_\_\_

\_\_\_\_\_

Example: \_\_\_\_\_

- b) Explain the purpose of modularisation and identify an example of how it is used in the stimulus. Use corresponding line numbers in your response. *[2 marks]*

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**QUESTION 13 (12 marks)**

Refer to Stimulus 2 in the stimulus book.

- a) Use pseudocode to symbolise a one-time pad encryption algorithm with any lower case letters. Users must input the plain text and key. *[7 marks]*

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b) Evaluate the encryption algorithm developed in Question 13a) by performing a desk check. Use the plain text and key provided. Specify all inputs and outputs in table form.

**Plain text:** Queens

**Key:** ryjwah

**Example output:** hsnanz

*[5 marks]*

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**QUESTION 14 (6 marks)**

Refer to Stimulus 3 in the stimulus book.

A secondary school stores encrypted student results in a database. To access their results, students must log in using their student ID and password. Login details are checked against the database to ensure only authorised students can gain access.

Passwords are encrypted for added security. Once logged in, students must enter a public decryption key to have their results displayed.

The database contains overall results for all subjects and students. Only results linked to the relevant student ID are displayed; students cannot view other students' results.

The algorithm for this system is incomplete. Complete the algorithm using the supplied code library.

BEGIN

```
GET studentID from input form  
GET password from input form  
GET key from input form
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## Section 3

### Instruction

- This section has one question and is worth 31 marks.
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### QUESTION 15 (31 marks)

Digital Solutions students decide to generate an application to manage fundraising activities for their school. Students and staff need to be able to log in, view items and their prices, and select items for purchase. Payments will not be processed by the web application; payment details will be recorded in a database and processed manually by school administration staff.

School administration staff manually add item details to the application as they are donated and purchased. Once an order has been placed, stock availability should automatically update.

School administration staff would also like to view order history to determine the popularity of items.

- a) Develop a data flow diagram to address all user needs and application requirements, using the response space on the next page.

*[19 marks]*


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**Note:** If you make a mistake in the diagram, cancel it by ruling a single diagonal line through your work and use the additional response space at the back of this question and response book.

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b) The wireframe represents a user interface component of the fundraising application. Synthesise this wireframe and your response for Question 15a) to determine which processes have occurred in the system to result in this user interface. Justify your response with relevant interface elements.

[4 marks]

 **School fundraising application**

Logged in as Username 


[View cart](#)



**Item name**  
Item description

**\$0.00**

[Buy item](#)



**Item name**  
Item description

**\$0.00**

[Buy item](#)

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c) What processes and data flows will occur when a user interacts with the user interface?  
Justify your response with relevant interface elements.

*[5 marks]*

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d) Assuming the system is successfully implemented, evaluate the personal, social and economic impacts of this application. Refer to specific features of the application in your response.

[3 marks]

Personal: \_\_\_\_\_

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Social: \_\_\_\_\_

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Economic: \_\_\_\_\_

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**ADDITIONAL PAGE FOR STUDENT RESPONSES**

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