

— Public use —

LUI

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Venue code

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School name

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Given name/s

--

Family name

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Attach your
barcode ID label here

Sample assessment 2020

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 (71 marks)

- 5 short response questions

Section 3 (24 marks)

- 1 extended response question



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"/>

	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"/>

Section 2

Instructions

- Write using black or blue pen.
 - Respond in paragraphs consisting of full sentences.
 - 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 five questions and is worth 71 marks.
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QUESTION 11 (6 marks)

Describe two elements of visual communication that can be implemented to enhance the user experience.

QUESTION 12 (17 marks)

Refer to Stimulus 1 in the stimulus book. Pseudocode has been developed for a two-player ‘guess the number’ game.

The game is played when:

- Player 1 inputs a number ranging from and including 1 to 10
- Player 2 attempts to guess the number entered by Player 1. Player 2 has three attempts to guess the correct number.

a) The pseudocode contains errors. Analyse the pseudocode to identify and explain each error. Using the same variables, make refinements to the pseudocode to correct the identified errors.

[9 marks]

b) Desk check your corrected algorithm by completing the test table below. Include any WRITE statements that are generated during testing.

Assume Player 1 inputs the number 5, Player 2 is **not** able to correctly guess the answer during any of their attempts, and all Player 2 inputs are valid.

Player 1 input	Loop	Guess	Value of 'Correct' at Line 21	Output

[8 marks]

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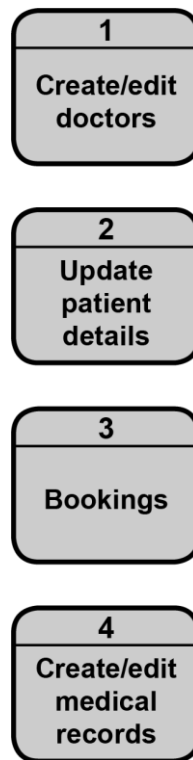
QUESTION 13 (18 marks)

A medical practice is developing a system for their patient bookings and record keeping. A centralised database store will be implemented with access available from several medical practices across the city.

The system will contain a variety of non-encrypted patient information (e.g. names and contact details), patient bookings, encrypted patient medical records and doctor information. Doctors will be able to enter and edit all data, but not bookings. Employees of each practice will be able to enter and edit patient information and bookings, but not medical records. Patients will be able to enter and update their own patient information and enter and view their own bookings.

- a) Symbolise the practice's networked database requirements in a high-level data flow diagram. The data flow diagram has been started for you below.

[10 marks]



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b) Explain two key security features required in this system and justify why you would include them.

[8 marks]

QUESTION 14 (13 marks)

Use pseudocode to write an algorithm to determine whether a word contains two consecutive letters that are the same.

Examples of words that contain two consecutive letters that are the same are 'ball', 'moon' and 'possible'.

QUESTION 15 (17 marks)

Refer to Stimulus 2 in the stimulus book. Stimulus 2 is an extract from a university course database that shows enrolled students, assessment items and student results for each assessment item.

The following query was developed to show all students (by ID) and their overall subject result.

```
SELECT ID, SUM (Mark / 100)  
FROM Results, Assess  
GROUP BY Item
```

- a) Evaluate the query and identify and describe any errors. *[6 marks]*

b) Refine the query to ensure it functions correctly. Justify the refinements made.

[7 marks]

c) Refine the query in 15b) to show only students with a subject rank of 'A'.

[4 marks]

Section 3

Instructions

- Write using black or blue pen.
- Respond in paragraphs consisting of full sentences.
- This section has one question and is worth 24 marks.

QUESTION 16 (24 marks)

In security systems, it is common practice to use a unique identifier of a numeric type, for example, a door lock code or PIN. People often store these numbers in an unsecured text file on personal devices.

A simple encryption method for a two-digit number is shown below.

!	@	#	\$	%	^	&	*	()
1	2	3	4	5	6	7	8	9	0

Plaintext number	Block key	Encrypted number	Ciphertext character
'4'	1 7 3 9 5 8 2 0 4 6	5	%
'5'	1 2 3 4 5 6 7 8 9 0	6	^

Therefore, the Plaintext number '45' would output Ciphertext '%^'.

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a) Develop a low-fidelity prototype solution key for any four-digit PIN (e.g. 7826) with associated key and predicted output. The algorithm must read data from a user input, and output encrypted data to a file. Annotate the pseudocode in the table below to identify the location of assignment, condition, and modularisation. Evaluate the algorithm using a desk check and write the output at each step. *[18 marks]*

Original	Key										Encrypted number	Character	

- b) Compare this encryption method with a standard Caesar cipher, explaining three advantages and/or disadvantages of each method. Explain which of these two methods is the more secure method to use and justify your response.

[6 marks]

END OF PAPER

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