



Rewarding Learning

**ADVANCED SUBSIDIARY (AS)**  
**General Certificate of Education**  
**2022**

Centre Number

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Candidate Number

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# Digital Technology

Assessment Unit AS 2

*assessing*

Fundamentals of  
Digital Technology



\*SDT21\*

**[SDT21]**

**MONDAY 16 MAY, AFTERNOON**

## TIME

1 hour 30 minutes.

## INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

**You must answer the questions in the spaces provided.**

**Do not write outside the boxed area on each page or on blank pages.**

**You are not permitted to use any calculating aid in this paper.**

Complete in black ink only. **Do not write with a gel pen.**

Answer **all five** questions.

## INFORMATION FOR CANDIDATES

The total mark for this paper is 100.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Questions **3(e)** and **4(f)**.



- 1 (a) By converting both units to bytes, calculate how many gigabytes there are in a terabyte.

One gigabyte = \_\_\_\_\_ bytes

One terabyte = \_\_\_\_\_ bytes

One terabyte = \_\_\_\_\_ gigabytes

[3]

- (b) 128 characters can be represented in ASCII using 7 bits. Suggest a use for the eighth bit in each byte.

\_\_\_\_\_  
\_\_\_\_\_ [1]

- (c) Describe one advantage and one disadvantage of using Unicode instead of ASCII to represent characters.

Advantage \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Disadvantage \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [4]



(d) Convert each of the following two's complement binary numbers to decimal.  
You must show all your working.

$00010011_2$

$11111111_2$

[4]

(e) Convert the decimal number  $-40$  to an 8-bit two's complement binary number.  
You must show all your working.

[3]

[Turn over



**2 (a)** The way in which information is presented can affect its quality. Apart from presentation, name four other factors which can affect the quality of information.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_ [4]

**(b)** Explain how data verification can be used to detect errors during data entry.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [4]

**(c)** Describe each of the following methods of data validation.

Range \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_





Format \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Lookup \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [6]

(d) The last digit of the product code **03253** is a modulus 11 check digit.

Determine whether or not this product code is valid. You must show all your working.

[6]

[Turn over



**3** A computer contains a number of internal components.

**(a)** Describe how each of the following is used in a computer.

Address bus \_\_\_\_\_

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ROM \_\_\_\_\_

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Port \_\_\_\_\_

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\_\_\_\_\_ [6]

**(b)** Explain how cache memory is used by the processor.

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\_\_\_\_\_ [3]



**(c)** Explain the role of the following registers during the fetch-execute cycle.

Program Counter \_\_\_\_\_

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Memory Data Register \_\_\_\_\_

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[4]

**(d)** A science class uses a smartphone to record a video of an experiment.

Explain why the smartphone needs secondary storage.

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[2]

[Turn over







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**[Turn over**



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4 (a) Describe each of the following types of operating system.

Multitasking \_\_\_\_\_

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Multithreading \_\_\_\_\_

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[6]

(b) Explain how archive software is used by a typical organisation.

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[4]



**(c)** Images can be stored using data compression. Describe one advantage and one disadvantage of using data compression for an image inserted in a web page.

Advantage \_\_\_\_\_

\_\_\_\_\_

Disadvantage \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [4]

An application software developer develops a new game. The game can be used on a tablet.

**(d)** Explain what is meant by application software.

\_\_\_\_\_

\_\_\_\_\_ [2]

[Turn over



(e) The tablet uses voice recognition.  
Explain how voice recognition is achieved.

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[4]





5 (a) Explain the following web technology terms.

Web browser \_\_\_\_\_

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The World Wide Web \_\_\_\_\_

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[4]

(b) Explain the difference between client-side and server-side processing.

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[4]



(c) Explain how CSS can be used to ensure that the appearance of all pages in a website is consistent.

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[4]

[Turn over







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For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	

<b>Total Marks</b>	
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Examiner Number

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