

CANDIDATE
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COMPUTER SCIENCE

2210/12

Paper 1 Theory

October/November 2018

1 hour 45 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

No calculators allowed.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces at the top of this page.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

No marks will be awarded for using brand names of software packages or hardware.

Any businesses described in this paper are entirely fictitious.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The maximum number of marks is 75.

This document consists of **11** printed pages and **1** blank page.

1 Computers use a character set to convert text into binary.

One character set that can be used is ASCII.

Each letter in ASCII can also be represented as a denary value.

(a) The word BUS has the denary values:

B	U	S
66	85	83

Convert the denary values into 8-bit binary.

66							
85							
83							

[3]

(b) Each letter in ASCII can also be represented as a hexadecimal value.

The word KEY has the 8-bit binary values:

K	E	Y
01001011	01000101	01011001

(i) Convert the three 8-bit binary values into hexadecimal.

01001011
01000101
01011001

[3]

(ii) Give **three** other uses of hexadecimal notation in computer science.

1

2

3

[3]

(iii) State **two** benefits of using hexadecimal notation to represent binary values.

Benefit 1

.....

Benefit 2

.....

[2]

2 A computer uses RAM and ROM to store data.

(a) The table contains three statements about RAM or ROM.

Tick (✓) to show whether each statement describes **RAM** or **ROM**.

Statement	RAM (✓)	ROM (✓)
Stores the programs and data that are currently in use		
Used to boot up the computer when power is turned on		
Contents are retained when power is turned off		

[3]

(b) Circle the storage category that includes both RAM and ROM.

Primary

Secondary

Off-line

[1]

(c) Explain what is meant by off-line storage.

.....

.....

.....

..... [2]

3 A greenhouse uses a system to monitor the conditions that plants need to grow.

The inputs to the system are:

Input	Binary value	Condition
W	1	Window is open
	0	Window is closed
T	1	Temperature $\geq 26^{\circ}\text{C}$
	0	Temperature $< 26^{\circ}\text{C}$
H	1	Humidity $\geq 50\%$
	0	Humidity $< 50\%$

The system will sound an alarm when certain conditions are detected.

Alarm (X) will sound (=1) when:

window is closed and temperature $\geq 26^{\circ}\text{C}$

or

temperature $< 26^{\circ}\text{C}$ and humidity $\geq 50\%$

Draw a logic circuit to represent the system.



[5]

(b) Karina correctly answers another examination question about some more output devices.

Five different terms have been removed from her answer.

Complete the sentences in Karina's answer, using the list given. Not all terms in the list need to be used.

- 3D
- digital light projector
- inkjet
- interactive whiteboard
- laser
- rotating
- scanning
- sliding
- speaker
- thermal bubble

An allows a user to write on a surface using a pen, the text and drawings can then be captured and stored for later use.

An printer produces a hard copy of a document using and piezoelectric technology. A printer uses a drum, and positive and negative charges, to produce a hard copy of a document.

[5]

- 6 (a) Many programmers write computer programs in high-level languages. The programs need to be translated into machine code to be read by the computer.

State **two** types of translator that can be used.

Translator 1

Translator 2

[2]

- (b) Explain **two** reasons why a computer programmer may choose to write a program in a high-level language, rather than a low-level language.

Reason 1

.....

.....

.....

Reason 2

.....

.....

.....

[4]

- (c) **Three** examples of computer code are given in the table.

Tick (✓) to show whether each example of computer code is **High-level language**, **Assembly language** or **Machine code**.

Computer code	High-level language (✓)	Assembly language (✓)	Machine code (✓)
10110111 11001100 01011100			
FOR X = 1 TO 10 PRINT X NEXT X			
INP X STA X LDA Y			

[3]

9 (a) Computers can transmit data using different methods.

Describe the **three** data transmission methods given.

(i) Serial data transmission

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

(ii) Parallel data transmission

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

(iii) Duplex data transmission

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

(b) Data can sometimes be corrupted when it is transmitted from one computer to another, causing errors to be present in the data.

Identify and describe **three** methods of error detection that could be used to see if an error has occurred.

Error detection method 1

Description

.....

.....

.....

Error detection method 2

Description

.....

.....

.....

Error detection method 3

Description.....

.....

.....

.....

[9]

10 A system uses pH sensors and a microprocessor to help monitor pollution in a river.

The pH of the water should be between 6 and 8. The system outputs an alert if the pH of the water is not in this range.

Explain how the system uses the pH sensors and the microprocessor to help monitor the pollution.

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.....[5]

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