Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

9942271244

COMPUTER SCIENCE **0478/11**

Paper 1 Theory **October/November 2015**

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.

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.

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1 **(a)** Four hardware items are shown in the table below.

For each hardware item:
- name a suitable application
- state how it is used in the application

Give a different application in each case.

Hardware item	Application	How the hardware item is used
Barcode reader	.....	.....
Microphone	.....	.....
Touch screen	.....	.....
Infrared sensor	.....	.....

[8]

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(b) Describe **two** differences between Blu-ray discs and DVDs.

1 .....

.....

2 .....

.....

[2]

(c) Describe **two** differences between DVD-R and DVD-RAM.

1 .....

.....

2 .....

.....

[2]

2 **(a)** Convert the hexadecimal number **B5** into binary:

.....

Convert the binary number **1 1 1 1 0 1 1 0** into hexadecimal:

.....

[2]

(b) Give **two** examples where hexadecimal numbers are used in computer science.

1 .....

.....

2 .....

.....

[2]

(c) State **two** benefits of using hexadecimal numbers in computer science.

1 .....

.....

2 .....

.....

[2]

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3 **(a)** Three statements about cookies are shown below.

Study each statement.

Tick (✓) to show whether the statement is true or false.

Statement	True	False
Cookies can destroy or modify data in a computer without the user's knowledge		
Cookies generate website pop-ups		
Cookies allow a website to detect whether a viewer has viewed specific web pages		

[3]

(b) Two features of Von Neumann architecture are the use of registers and the use of buses.

Give the names of **two** registers and **two** buses.

Registers

1 .....

.....

2 .....

.....

Buses

1 .....

.....

2 .....

.....

[4]

4 Six computer terms and six descriptions are shown below.

Draw a line to link each term to its appropriate description.

Term	Description
Browser	Signal sent to a processor which may cause a break in execution of the current routine, according to priorities
HTML	Company that provides individual's access to the Internet and other services such as web hosting and emails
Internet service provider	Software application used to locate, retrieve and display content on the World Wide Web e.g. web pages, videos and other files
Interrupt	Hardware identification number that uniquely identifies each device on a network; it is manufactured into every network card and cannot be altered
IP address	Authoring language used to create documents on the World Wide Web; uses tags and attributes
MAC address	Location of a given computer/device on a network; can be a static or dynamic value

[5]

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[Turn over

5 **(a)** Inkjet printers and laser printers are two common types of printer.

Describe the features and principles of operation of each type of printer.

(i) Inkjet printer

.....

.....

.....

.....

.....

.....

.....

..... [4]

(ii) Laser printer

.....

.....

.....

.....

.....

.....

.....

..... [4]

(b) Another type of printer is the 3D printer.

Describe 3D printing.

.....

.....

.....

.....

.....

..... [3]

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6 **(a)** State what is meant by encryption.

.....

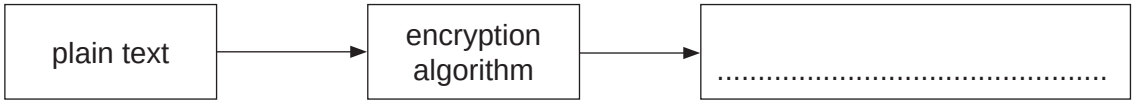
..... [1]

(b) State what is meant by symmetric encryption.

.....

..... [1]

(c) Complete the diagram:



[1]

7 **(a)** Describe what is meant by lossy and lossless compression when applied to files.

Lossy .....

.....

.....

Lossless .....

.....

.....
[2]

(b) Name and describe **one** type of file that uses lossy compression.

Name .....

Description .....

.....

.....
[2]

(c) A company advertises its backup memory device as having 500 GB of storage.
A customer wishes to know how many 8 MB files could be stored on the device.

The company claimed that up to 62 500 files (assuming each file is 8 MB) could be stored.

The customer calculated that 64 000 files could be stored.

Explain the difference between these two storage values. Show any calculations you use in your explanation.

.....

.....

.....

.....

.....

.....

..... [3]

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8 State **three** features of a typical operating system.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

9 **(a)** Nicolae made the following statement:
"data input is validated by typing it in twice"

State why this statement is incorrect.

.....

..... [1]

(b) Nicolae needs to send 30 photos to a friend and he chooses to send all 30 together as a single email attachment. Each photo is 1.8 MB in size, but the maximum possible attachment size is only 20 MB.

State how Nicolae can solve this problem.

.....

..... [1]

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[Turn over

10 Characters can be represented in a computer by a numerical code.

The following list shows 16 characters with their numerical codes in denary:

a = 97	e = 101	k = 107	t = 116
b = 98	g = 103	m = 109	u = 117
c = 99	h = 104	o = 111	w = 119
d = 100	i = 105	r = 114	

. = 46 (code for the full stop)

Web addresses can be written using hexadecimal rather than denary. Hexadecimal codes are preceded by a % sign. For example, the word "**c a g e**" is written as:

either	99	97	103	101	(in denary)
or	%63	%61	%67	%65	(in hexadecimal)

(a) Complete the conversion of the following web address into hexadecimal:

w	**w**	**w**	**.**	**c**	**i**	**e**	**.**	**o**	**r**	**g**	**.**	**u**	**k**
%77	%77	%77											

[3]

(b) Complete the web address from the given hexadecimal codes:

%77	**%77**	**%77**	**%2E**	**%72**	**%6F**	**%63**	**%6B**	**%69**	**%63**	**%74**	**%2E**	**%63**	**%6F**	**%6D**
W	W	W												

[3]

11 A passenger logs onto an airline website and types in the reference number for their flight. Once the passenger accesses their account they can choose their seat and also print out a boarding pass which contains a unique barcode. This barcode is scanned at the airport check-in desk.

Name **one** input and **one** output device found at the check-in desk and give a reason for your choice.

Input device .....

Reason .....

.....

Output device .....

Reason .....

.....

[4]

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12 Parity checks are used to check for errors during data transmission. A system uses **odd** parity.

(a) Complete the following two bytes of data so that they both have **odd** parity:

	1	1	1	1	0	0	0

	0	0	0	0	1	1	1

[2]

(b) Name and describe another method which can be used to check whether data has been correctly transmitted.

Name of method .....

Description .....

.....

.....

[2]

13 Identify which **five** computer terms are being described below.

(a) A system designed to prevent unauthorised access to or from a private network or intranet; it examines all data traffic to and from the network and filters out anything that does not meet certain criteria.

..... [1]

(b) Software that can be used on a trial basis before buying the full version; it often does not include all the features of the full version or has a time limit before it stops working.

.....[1]

(c) A protocol for transmitting private documents via the Internet; it uses two keys to encrypt the data – a public key and a private key.

.....[1]

(d) A standard adopted by the electronic music industry for controlling devices that produce music, such as synthesisers and sound cards.

.....[1]

(e) A device that allows audio signals to be converted into electrical signals which can be interpreted by a computer after being converted into digital signals.

.....[1]

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