Cambridge Assessment International Education

Cambridge International AS & A Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

2846093377

COMPUTER SCIENCE **9608/13**

Paper 1 Theory Fundamentals **May/June 2020**

1 hour 30 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use an HB pencil for any diagrams, graphs or rough working.
- Calculators must **not** be used in this paper.

INFORMATION

- The total mark for this paper is 75.
- The number of marks for each question or part question is shown in brackets [ ].
- No marks will be awarded for using brand names of software packages or hardware.

This document has **16** pages. Blank pages are indicated.

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1 Ana owns a small company with four employees. The office has a network containing several computers that run on a client-server model. There is one server that connects to the Internet using a router.

(a) Networks transmit data using various types of connection shown in the following table.

Complete the table.

Type of connection	Description
Fibre-optic	....
....	A communication device in Earth's orbit that receives and transmits data
Radio waves	....
....	Carries data as electrical signals and can consist of a twisted pair

[4]

(b) Explain how the client-server model enables the employees to access the same files from different computers.

.....

.....

.....

.....

.....

..... [2]

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(c) Each computer in the network has a private IP address.

Give **two** reasons why the computers do **not** have public IP addresses.

1 .....

.....

2 .....

.....

[2]

2 Billy has a laser printer.

(a) Complete the following description of the basic internal operation of a laser printer.

The printer uses a ..... and a rotating .....

to draw the contents of the page on the photosensitive drum as .....

charge. The ..... is attracted to this charge.

[4]

(b) The laser printer has both RAM and ROM.

Describe the purpose of RAM and ROM in the **laser printer**.

RAM .....

.....

.....

.....

ROM .....

.....

.....

.....

[4]

(c) Billy's computer has several ports.

(i) State the purpose of a port.

.....

..... [1]

(ii) Identify **one** type of port.

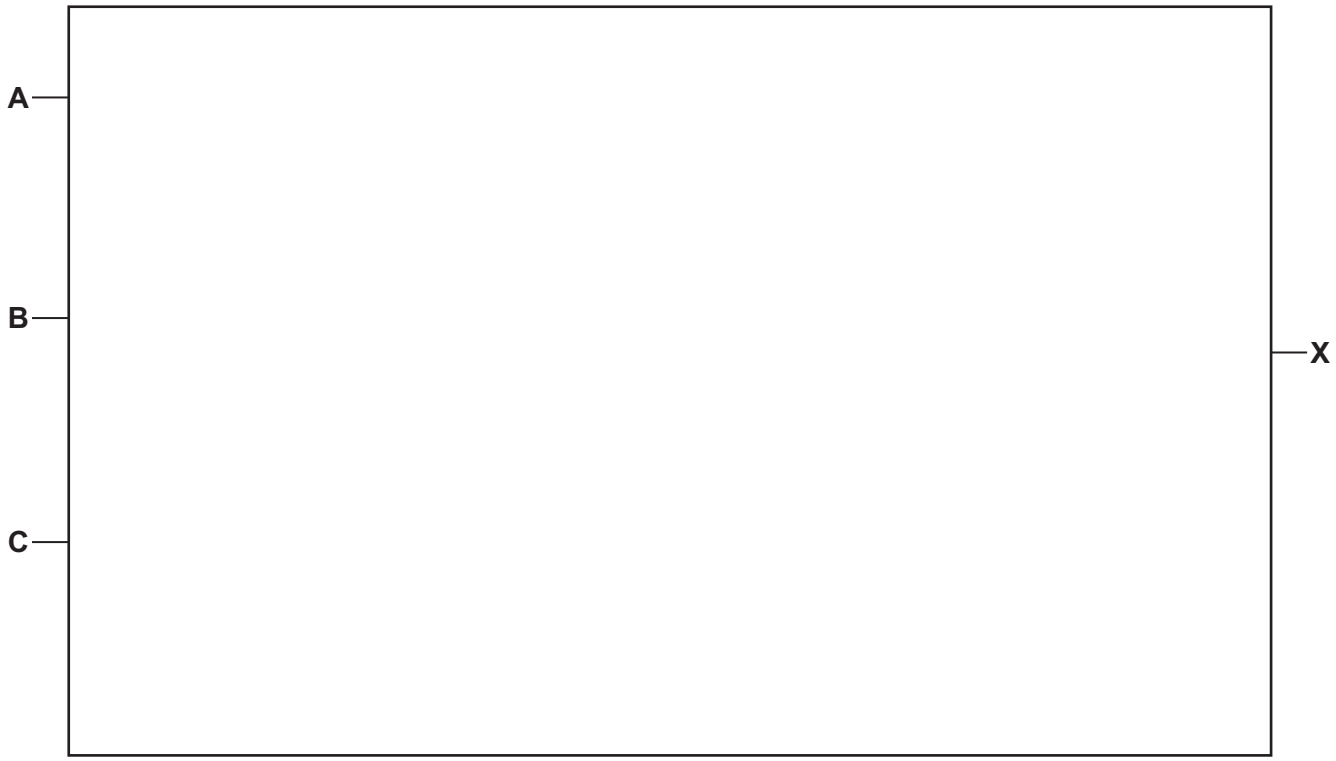
.....

..... [1]

3 **(a)** The following is a logic expression.

X = NOT(**A** OR **B**) OR (**A** AND (**B** XOR **C**))

Draw the logic circuit for the given expression, using a maximum of **four** logic gates.



[4]

(b) Complete the truth table for the logic expression:

X = NOT(**A** OR **B**) OR (**A** AND (**B** XOR **C**))

A	B	C	Working space	X
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

[4]

(c) The following is a logic expression.

A AND **B** XOR **C** OR NOT **A**

Identify **one** logic gate that would **not** be used in the logic circuit for this expression.
Draw the symbol for the logic gate.

Logic gate .....

Logic gate symbol:

[2]

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4 Annchi is writing a computer game with a group of friends.

(a) One of her friends has suggested using Dynamic Link Library (DLL) files to help them develop the game.

(i) Give **three** reasons why Annchi and her friends should use DLL files when developing the game.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(ii) Give **two** reasons why Annchi and her friends should **not** use DLL files when developing the game.

1 .....

.....

2 .....

.....

[2]

(b) Each member of the group is creating a different part of the game. Each person needs to test their part of the game independently before they are combined.

Identify the **most appropriate** type of translator that should be used to test each part of the game independently. Justify your choice.

Translator .....

Justification .....

.....

.....

.....

.....

[3]

(c) Annchi needs to decide which type of software licence to use for the game.

(i) Give **two** benefits to **Annchi** of using a commercial licence.

1 .....

.....

2 .....

.....
[2]

(ii) Give **one** benefit to the **customers** of the game being released using a commercial licence.

.....

..... [1]

(iii) Describe **one** benefit to the **customers** of the game being released using a shareware licence.

.....

.....

.....

..... [2]

5 Wei is developing a program.

(a) He wants to make sure the source code is secure on his laptop.

Explain how encrypting the source code can keep it secure.

.....

.....

.....

.....

.....

..... [3]

(b) Wei wants to compress the source code to transport it to another computer.

Identify the **most appropriate** compression technique he should use.

Justify your choice.

Compression technique .....

Justification .....

.....

.....

.....

.....

[3]

6 Sheila creates a relational database for her hotel using a Database Management System (DBMS).

(a) Draw **one** line from each database term to its most appropriate description.

Database Term	Description
Primary key	A field in one table that links to a primary key in another table
Attribute	A collection of records and fields
Foreign key	The type of data that is being stored
Entity	A unique identifier for each tuple
	A data item, represented as a field within a table
	The concept or object in the system that we want to model and store information about

[4]

(b) Identify **three** tasks that Sheila can perform using the DBMS developer interface.

1 .....

2 .....

3 .....

[3]

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(c) Sheila creates the database HOTEL with the following table structure:

ROOM(RoomNumber, RoomType)

BOOKING(BookingID, RoomNumber, CustomerID, StartDate)

CUSTOMER(CustomerID, FirstName, LastName, Address, Tel_Num)

(i) The following table shows some sample data for the table ROOM.

RoomNumber	RoomType
1	Standard
2	Double
3	Executive
4	Standard

Complete the Data Definition Language (DDL) statement to create the table ROOM.

```
..... TABLE ROOM(
  RoomNumber Integer,
  RoomType .....,
  ..... (RoomNumber)
);
```

[3]

(ii) Room number **5** is a **Double** room.

Complete the Data Manipulation Language (DML) statement to add the details for room number 5 to the table ROOM.

```
INSERT ..... ROOM
VALUES(.....);
```

[2]

(iii) The table BOOKING needs an additional field to store the number of nights (for example, 3) a customer is staying.

Write a Data Definition Language (DDL) statement to add the new field to the table BOOKING.

.....

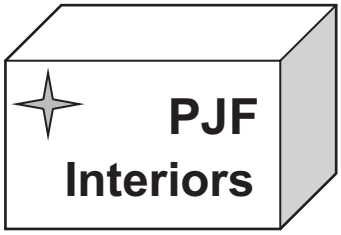
.....

.....

.....

..... [2]

7 Xiaoming created the following logo using bitmapped graphics software.



(a) Describe how **one** typical feature of bitmapped graphics software was used to create the logo.

.....

.....

.....

..... [2]

(b) The finished logo is 160 pixels wide and 160 pixels high. The image has a colour depth of 3 bytes per pixel.

Calculate an estimate of the file size for the logo. Give your answer in kilobytes. Show your working.

Working .....

.....

.....

Answer ..... KB

[3]

(c) Xiaoming needs to use his logo on his business card, on his website and on large display boards. He is told that he should have created a vector graphic logo instead of a bitmapped graphic logo.

Describe **one** benefit of creating a vector graphic logo instead of a bitmapped graphic logo.

.....

.....

.....

..... [2]

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(d) The hexadecimal colour value of the background of Xiaoming's website is:

913C8E

Complete the following table by converting each hexadecimal value to denary value.

	Red	**Green**	**Blue**
Hexadecimal value	91	3C	8E
Denary value			

[2]

(e) Part of Xiaoming's website contains the JavaScript function `performTask()`.

```
function performTask(){
    var value1;
    value1 = document.getElementById("FirstBox").value;

    if (value1 == "Yes"){
        document.getElementById("paragraph1").innerHTML = "Agreed";
    } else if(value1 == "No"){
        document.getElementById("paragraph1").innerHTML = "Sorry";
    } else {
        alert("Error")
    }
}
```

Describe the purpose of the following JavaScript statements from the function `performTask()`.

(i) `alert("Error")`

.....

..... [1]

(ii) `value1 = document.getElementById("FirstBox").value;`

.....

.....

.....

..... [2]

(iii) `document.getElementById("paragraph1").innerHTML = "Agreed";`

.....

.....

.....

..... [2]

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