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## 9608/13

May/June 2020

You must answer on the question paper.

No additional materials are needed.

- 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.

- 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.

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**[Turn over**

- 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        | .....<br>.....<br>.....<br>.....                                         |
| .....<br>.....     | A communication device in Earth's orbit that receives and transmits data |
| Radio waves        | .....<br>.....<br>.....<br>.....                                         |
| .....<br>.....     | 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]

- (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.

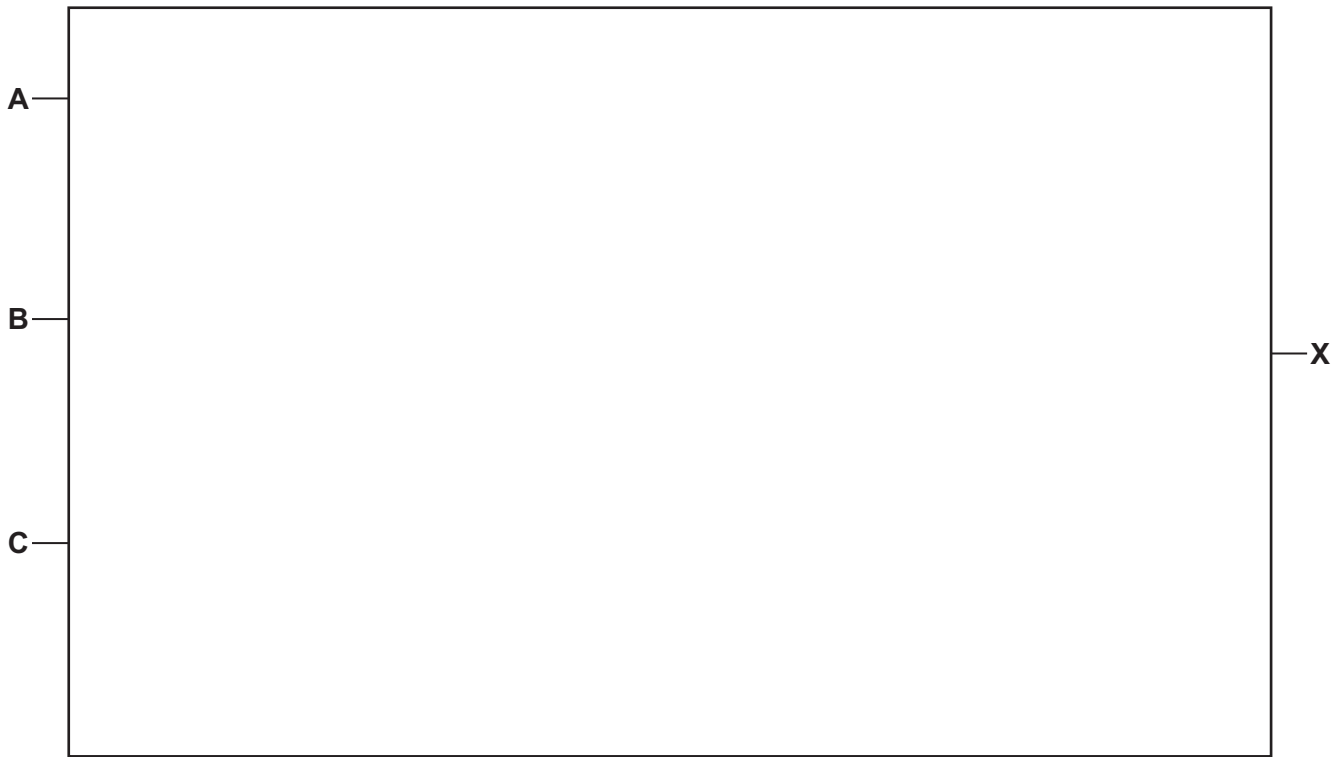
.....

..... [1]

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

$$X = \text{NOT}(A \text{ OR } B) \text{ OR } (A \text{ AND } (B \text{ XOR } C))$$

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:

$$X = \text{NOT}(A \text{ OR } B) \text{ OR } (A \text{ AND } (B \text{ XOR } C))$$

| 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.

$$A \text{ AND } B \text{ XOR } C \text{ OR NOT } A$$

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]

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]

- (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`.

```
.....

.....

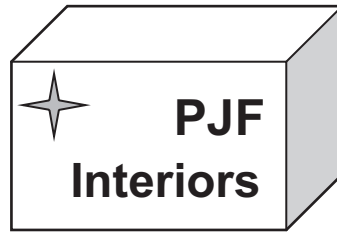
.....

.....

.....
```

[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]

(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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