

Hardware – 2021 O Level 2210

1. **Nov/2021//Paper_12/No.2**

A train company wants to install a self-service ticket machine system for its train stations. When the customer has purchased their tickets, the machine will provide a paper ticket.

(a) **One** output device that is used in the ticket machine is a display screen.

Identify **one** other output device that is used in the ticket machine system.

..... [1]

(b) The train company does **not** want users to use a keyboard or a mouse to enter their data, when buying a ticket. The company is worried that they may be stolen or get too dirty.

Identify **one** other input device that would be suitable for use in the ticket machine system, to allow users to enter their data.

..... [1]

2. Nov/2021//Paper_12/No.4

The paragraph explains the operation of different touch screen technologies.

Complete the paragraph using the list of terms. **Not** all terms in the list need to be used.

- capacitive
- change
- circuit
- conductive
- coordinates
- grid
- heat
- infra-red
- insulating
- light
- manufacture
- pressure
- resistive

In touch screen technology, an electrostatic field is present on the surface of the touch screen. The properties of a user cause a in the field. The of the user's touch can be calculated.

In touch screen technology, a user pushes the top layer of the screen and makes it connect with the bottom layer to complete a

This type of touch screen is cheaper to

[7]

3. Nov/2021//Paper_12/No.7

Five statements are given about devices.

Tick (✓) to show if each statement applies to a 3D scanner, barcode reader or a Quick Response (QR) code reader. Some statements may apply to more than **one** type of device.

Statement	3D scanner (✓)	Barcode reader (✓)	QR code reader (✓)
uses position and alignment markers for orientation when scanning			
scans the shape and appearance of an object			
uses reflected light from a laser to convert a black-and-white pattern into binary			
can often be built into an Electronic Point Of Sale (EPOS) terminal, for example, a supermarket checkout			
it is an example of an input device			

[5]

4. Nov/2021//Paper_12/No.9

Padma opens an application on her computer.

An interrupt is generated to inform the Central Processing Unit (CPU) that the application has been opened.

(a) Give **three** other examples of when an interrupt signal could be generated.

1

2

3

[3]

(b) State what would happen if interrupt signals were **not** used in a computer.

.....

..... [1]

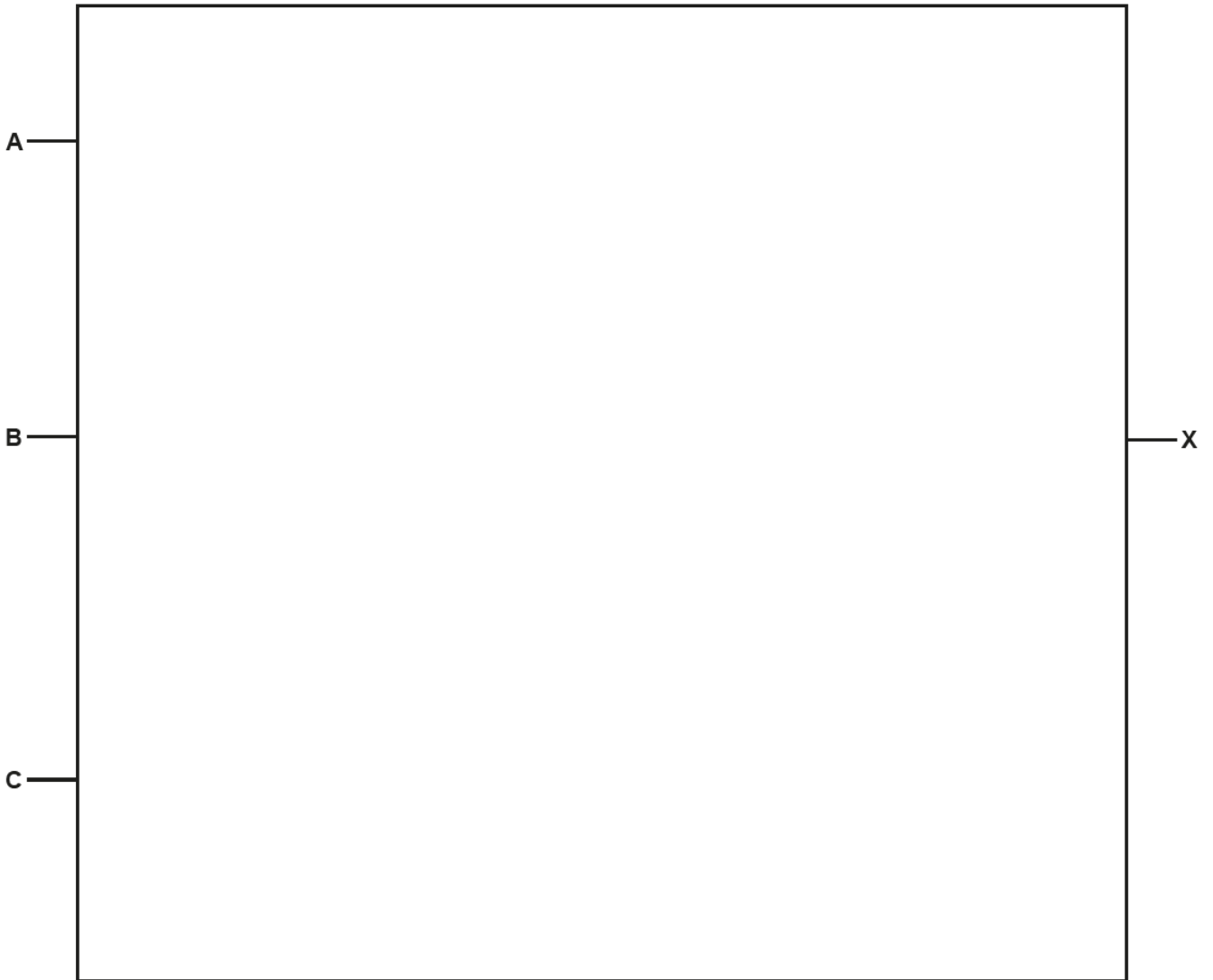
5. Nov/2021//Paper_12/No.11

Consider the following logic statement:

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

(a) Draw a logic circuit to represent the given logic statement.

Do **not** attempt to simplify the logic statement. All logic gates must have a maximum of **two** inputs.



[5]

(b) Complete the truth table for the given logic statement.

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) Identify **two** logic gates that are **not** included in the given logic statement.

Logic gate 1

Logic gate 2

[2]

6. June/2021//Paper_11/No.1b

Benedict has a computer that is assigned an Internet Protocol (IP) address. The IP address is:

198.167.214.0

The IP address is represented as denary values.

(a) Convert the denary values 167 and 214 from the IP address to 8-bit binary.

167								
-----	--	--	--	--	--	--	--	--

214								
-----	--	--	--	--	--	--	--	--

Working space

.....

.....

.....

.....

[2]

(b) Benedict's computer is also assigned a Media Access Control (MAC) address.

(i) Identify **one** similarity between an IP address and a MAC address.

.....

..... [1]

(ii) Identify **two** differences between an IP address and a MAC address.

Difference 1

.....

.....

Difference 2

.....

.....

[2]

7. June/2021//Paper_11/No.2b

Julia inputs personal data into her computer.

She stores three copies of the data using a hard disk drive (HDD), a solid state drive (SSD) and a USB flash memory drive.

(a) Identify **three** devices Julia can use to input personal data into her computer.

Device 1

Device 2

Device 3

[3]

(b) Six statements are shown about HDDs, SSDs and USB flash memory drives.

Tick (✓) to show which statements apply to each type of storage. Some statements can apply to more than one type of storage.

Statement	HDD (✓)	SSD (✓)	USB flash memory drive (✓)
it has no moving parts			
it is non-volatile			
it can use NAND gates to store data			
it uses magnetic properties to store data			
it has the smallest physical size			
it has the slowest read/write speeds			

[6]

8. June/2021//Paper_12/No.2

Data storage can be magnetic, solid state or optical.

(a) Six statements are given about data storage.

Tick (✓) to show if the statement applies to magnetic, solid state or optical storage. Some statements may apply to more than one type of storage.

Statement	Magnetic (✓)	Solid state (✓)	Optical (✓)
no moving parts are used to store data			
pits and lands are used to store data			
data is stored on platters			
flash memory is used to store data			
parts are rotated to store data			
data can be stored permanently			

[6]

(b) (i) Give **one** example of magnetic storage.

..... [1]

(ii) Give **one** example of optical storage.

..... [1]

(iii) Identify which type of storage would be the most suitable for use in a web server and justify your choice.

Type of storage

Justification

.....

[3]

(c) Describe the operation of USB flash memory and how it stores data.

.....

.....

.....

.....

.....

..... [3]

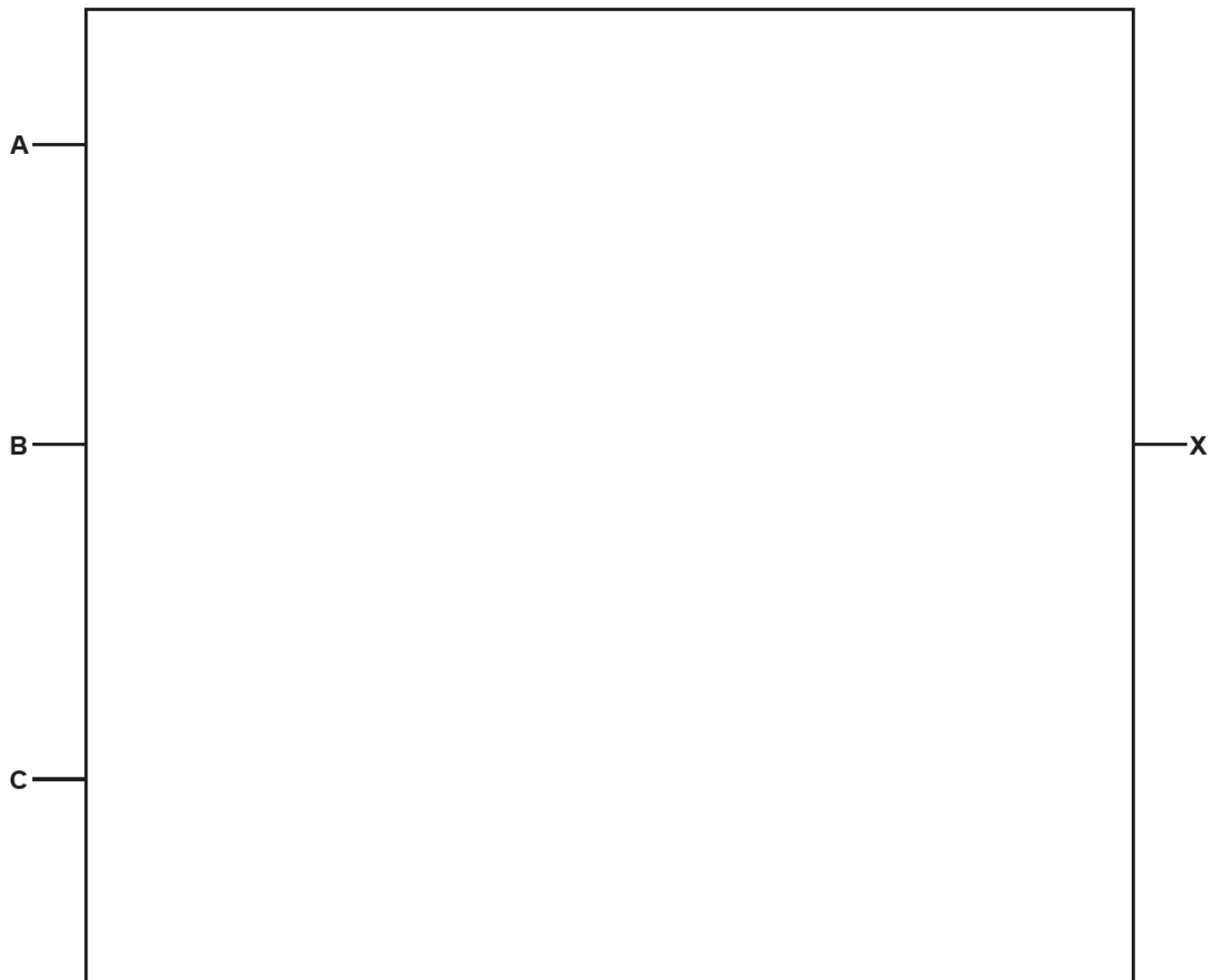
9. June/2021//Paper_12/No.3

Consider the logic statement:

$$X = (((\text{NOT } A \text{ AND } B) \text{ OR } C) \text{ AND } B) \text{ NOR } (B \text{ OR } C)$$

(a) Draw a logic circuit to represent the given logic statement.

Do **not** attempt to simplify the statement. All logic gates must have a maximum of **two** inputs.



[6]

(b) Consider the completed truth table for the given logic statement.

Row number	A	B	C	Working space	X
1	0	0	0		1
2	0	0	1		1
3	0	1	0		1
4	0	1	1		0
5	1	0	0		1
6	1	0	1		0
7	1	1	0		1
8	1	1	1		1

There are four errors in the truth table in the output (X) column.

Identify the **four** incorrect outputs.

Write the row number to identify each incorrect output.

Row

Row

Row

Row

[4]

10. June/2021//Paper_12/No.8

A keyboard is a type of input device that can be used to enter data into a computer.

Complete the paragraph that describes one method of operation for a keyboard, using the most appropriate terms from the given list. **Not** all terms in the list need to be used.

- Binary
- Breaks
- Calculated
- Character
- Circuit
- Current
- Information
- Network
- Press
- Processor
- Signal
- Switch

A keyboard has a key matrix underneath the keys. When a key is pressed, it presses a

..... that completes a This allows

..... to flow. The location of the key pressed is

..... . The location of the key pressed is compared to a

..... map to find the value for the key that

has been pressed.

[6]