

1. Question | 9618 May-June 2021 P1 V1 Q5

5 Kiara has a washing machine and a refrigerator.

(a) She has an embedded system in her washing machine.

Describe what is meant by an **embedded system**, using the washing machine as an example.

.....

.....

.....

..... [2]

(b) The washing machine’s embedded system makes use of both Random Access Memory (RAM) and Read Only Memory (ROM).

State the purpose of RAM and ROM within the washing machine’s embedded system.

RAM

.....

ROM

..... [2]

(c) The temperature in her refrigerator must be kept between 4 and 6 degrees Celsius.

The microprocessor in the refrigerator turns on the cooling if the temperature is too high, and turns off the cooling if the temperature is too low.

Explain why the system in the refrigerator is a control and not a monitoring system.

.....

.....

.....

.....

.....

..... [2]

5 Seth uses a computer for work.

(a) Complete the following descriptions of internal components of a computer by writing the missing terms.

The transmits the signals to coordinate events based on the electronic pulses of the

The carries data to the components, while the carries the address where data needs to be written to or read from.

The performs mathematical operations and logical comparisons.

[5]

(b) Describe the ways in which the following factors can affect the performance of his laptop computer.

Number of cores

.....

.....

.....

.....

Clock speed

.....

.....

.....

.....

[4]

(c) Seth accesses both software and data using cloud computing.

(i) Give **two** benefits of storing data using cloud computing.

- 1
-
- 2
-

[2]

(ii) Give **two** drawbacks of Seth using cloud computing.

- 1
-
- 2
-

[2]

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

Term	Description
	It is only visible to devices within the Local Area Network (LAN)
Public IP address	It increments by 1 each time the device connects to the internet
Private IP address	A new one is reallocated each time a device connects to the internet
Dynamic IP address	It can only be allocated to a router
Static IP address	It is visible to any device on the internet
	It does not change each time a device connects to the internet

5 Kiara has a washing machine and a refrigerator.

(a) She has an embedded system in her washing machine.

Describe what is meant by an **embedded system**, using the washing machine as an example.

.....

.....

.....

..... [2]

(b) The washing machine’s embedded system makes use of both Random Access Memory (RAM) and Read Only Memory (ROM).

State the purpose of RAM and ROM within the washing machine’s embedded system.

RAM

.....

ROM

..... [2]

(c) The temperature in her refrigerator must be kept between 4 and 6 degrees Celsius.

The microprocessor in the refrigerator turns on the cooling if the temperature is too high, and turns off the cooling if the temperature is too low.

Explain why the system in the refrigerator is a control and not a monitoring system.

.....

.....

.....

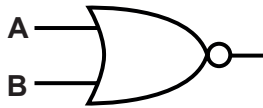
.....

.....

..... [2]

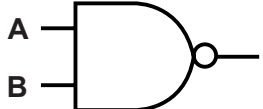
4. Question | 9618 Oct-Nov 2021 P1 V2 Q2

2 (a) Complete the truth table for each of the following two logic gates.



A logic gate with two inputs, A and B, and one output. The symbol is a D-shaped gate with a small circle at the output, representing a NOT operation.

A	B	Output
0	0	
0	1	
1	0	
1	1	



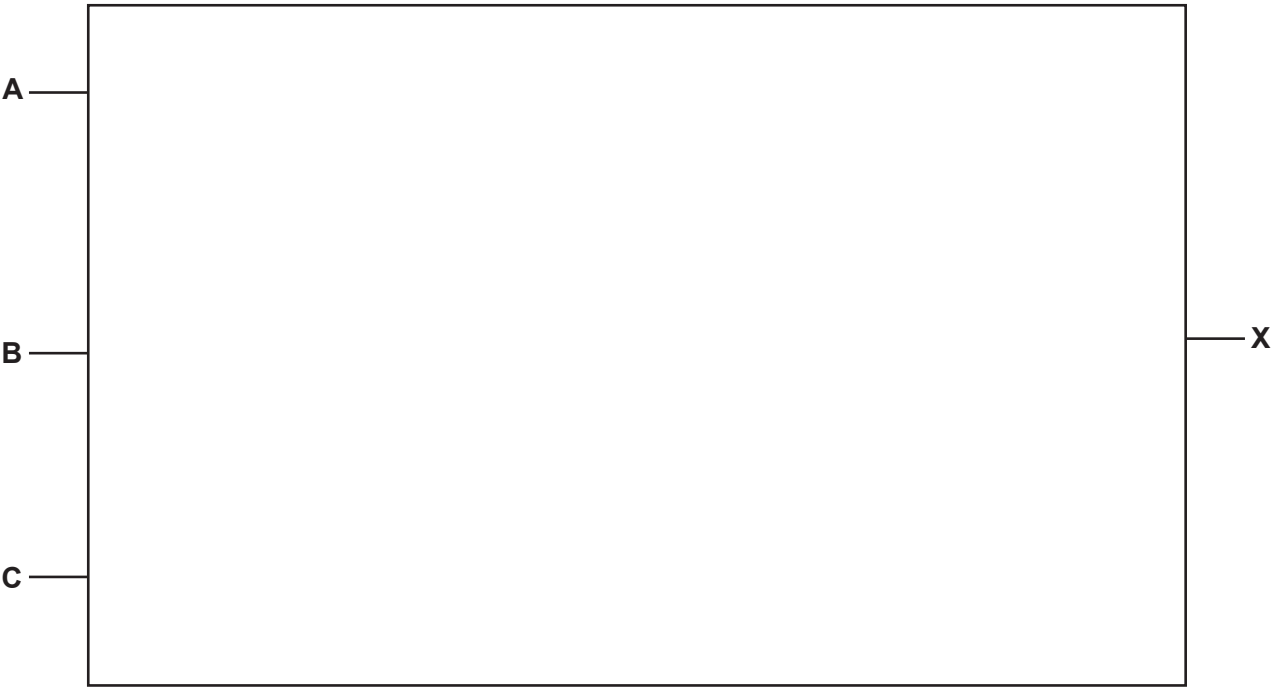
A logic gate with two inputs, A and B, and one output. The symbol is a D-shaped gate with a small circle at the output, representing a NOT operation.

A	B	Output
0	0	
0	1	
1	0	
1	1	

[2]

(b) Draw a logic circuit for the following logic expression.

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



[2]

3 Andy likes to play computer games.

(a) Andy uses several input devices to play the games. These include a keyboard and a microphone.

Describe the principal operation of a microphone.

.....

.....

.....

.....

.....

..... [3]

(b) Andy plays some of the computer games over the internet. He has several devices that connect wirelessly to the router in his house.

(i) Identify the topology of Andy’s home network. Justify your choice.

Topology

Justification

..... [2]

(ii) The router has a wireless access point (WAP) to allow the devices to connect wirelessly.

Identify **three** functions of the router in Andy’s network.

1

.....

2

.....

3

..... [3]

BLANK PAGE

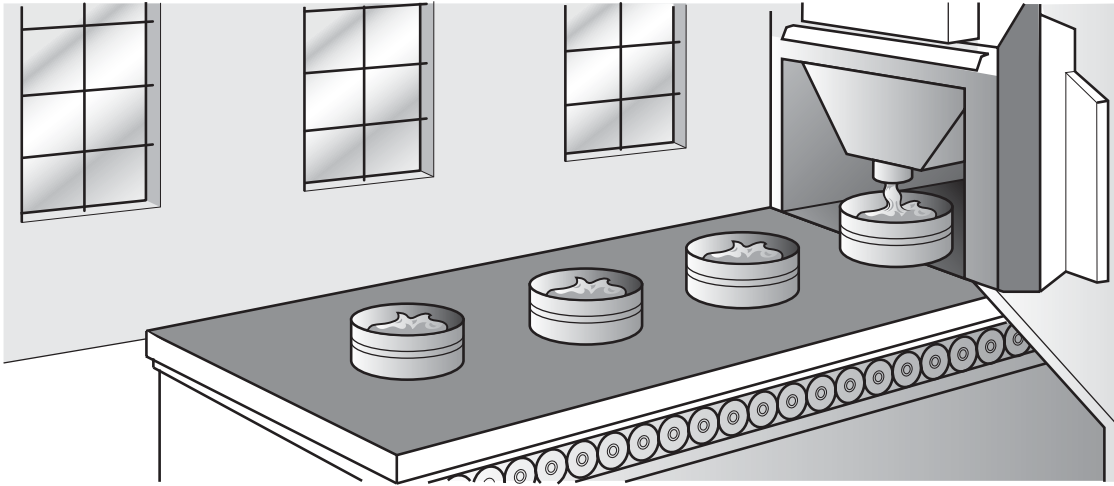
4 A cake factory uses machines to make cakes .

(a) Complete the following descriptions of types of system. Write the correct missing term in the spaces.

The factory uses a system to record data such as the number of cakes being produced each hour.

When the data collected from sensors are analysed and used as

..... it is a system. One example of this system, used in the factory, is to maintain a constant temperature in the ovens. It uses a to measure the values. [4]



[5]

(c) The cake factory has servers that store its confidential recipes and control the factory machines.

(i) Describe the implications of a hacker gaining access to the cake factory’s servers.

.....

.....

.....

.....

.....

.....

.....

..... [4]

(ii) Explain how the company could protect its data against hackers.

.....

.....

.....

.....

.....

.....

.....

..... [4]

- (d) The machines have a counter to record the number of cake tins filled. Each time a cake tin is filled, the counter is increased by 1. The value is stored in an 8-bit register, the current value is shown.

0	0	0	0	1	0	0	1
---	---	---	---	---	---	---	---

- (i) Show the value of the binary number after another five cake tins have been filled.

--	--	--	--	--	--	--	--

[1]

- (ii) The following table shows some assembly language instructions for a processor which has one general purpose register, the Accumulator (ACC).

Instruction		Explanation
Op code	Operand	
AND	#n	Bitwise AND operation of the contents of ACC with the operand
AND	<address>	Bitwise AND operation of the contents of ACC with the contents of <address>
XOR	#n	Bitwise XOR operation of the contents of ACC with the operand
XOR	<address>	Bitwise XOR operation of the contents of ACC with the contents of <address>
OR	#n	Bitwise OR operation of the contents of ACC with the operand
OR	<address>	Bitwise OR operation of the contents of ACC with the contents of <address>
LSL	#n	Bits in ACC are shifted logically n places to the left. Zeros are introduced on the right hand end
LSR	#n	Bits in ACC are shifted logically n places to the right. Zeros are introduced on the left hand end.

At the end of each day, the register is reset to 0.

Write the assembly language statement to reset the register to 0.

.....

..... [2]

(iii) A **two-place logical shift** to the **left** is performed on the binary number shown in **part (d)**.

Show the result of this logical shift.

--	--	--	--	--	--	--	--

[1]

(iv) State the mathematical result of a **one-place logical shift** to the **right** on a binary number.

.....

..... [1]

(e) The factory servers run software that makes use of Artificial Intelligence (AI).

Explain how the use of AI can help improve the safety and efficiency of the factory.

.....

.....

.....

.....

.....

.....

.....

..... [3]

2 A computer has hardware and software.

(a) The hardware includes different types of memory.

(i) Complete the description of computer memory.

Random Access Memory (RAM) and Read Only Memory (ROM) are both examples of memory.

One item that is stored in RAM is

One item that is stored in ROM is

RAM can be either Static RAM (SRAM) or Dynamic RAM (DRAM).

SRAM uses transistors arranged as

DRAM uses transistors and

[5]

(ii) Explain the difference between Programmable ROM (PROM), Erasable Programmable ROM (EPROM) and Electrically Erasable Programmable ROM (EEPROM).

.....

.....

.....

.....

.....

.....

..... [3]

9618 Computer Science Paper 1 - Hardware

Topical questions | 33 questions

7. Question part 2/3 | 9618 May-June 2022 P1 V1 Q2

(b) A magnetic hard disk is used to store data on the computer.

Describe the principal operations of a magnetic hard disk.

..... [5]

[5]

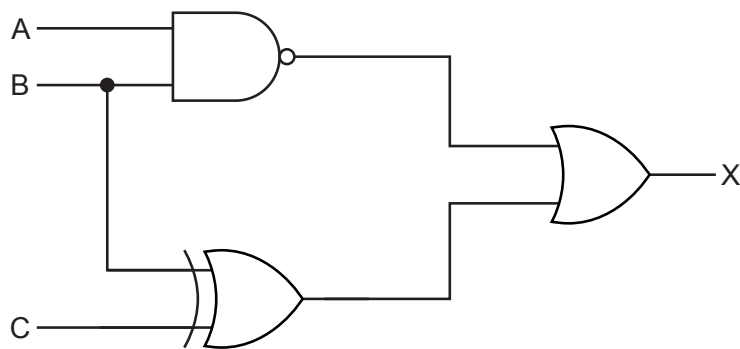
(c) Computers consist of logic gates.

(i) Complete the table by writing **one** set of values (input 1 and input 2) for each gate that will give the output 1.

Gate	Input 1	Input 2	Output
AND			1
NAND			1
XOR			1
NOR			1

[4]

(ii) Write the logic expression for the given logic circuit.



.....
.....
..... [3]

2 A car has several features.

- (a) One feature is a lane detection system. This system monitors the lines on either side of the lane. If the car gets too close to one line, the system automatically moves the car away from the line.

Explain why the lane detection system is an example of an embedded system.

.....

.....

.....

..... [2]

- (b) Two other features:

- record the number of miles travelled in the current journey, from when the engine is turned on to when it is turned off
- record the total number of miles the car has travelled since it was built.

Identify the data that will be stored in the primary **and** secondary storage of the car for these **two** features.

Primary

.....

Secondary

..... [2]

- (c) The car has a resistive touchscreen for the user to select options.

Tick (✓) **one** box in each row to show whether each statement about a resistive touchscreen is true or false.

Statement	True	False
The screen always has five different layers		
A processor determines the horizontal and vertical coordinates of the point of contact		
The touchscreen will work if any object touches the screen		

[1]

9 Many modern televisions are examples of embedded systems.

(a) Explain why these televisions are embedded systems.

.....

.....

.....

..... [2]

(b) Embedded systems use Electrically Erasable Programmable ROM (EEPROM).

Describe **one** benefit of using EEPROMs in an embedded system.

.....

.....

.....

..... [2]

3 (a) A greenhouse has an automatic window.

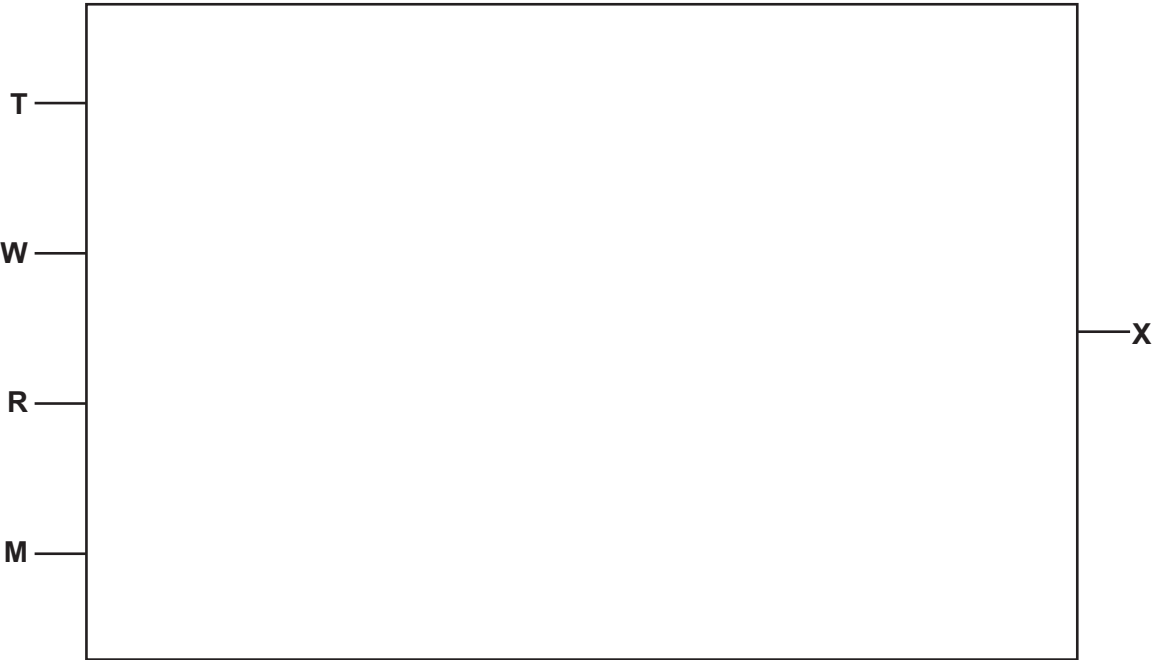
The window (**X**) operates according to the following criteria:

Parameter	Description of parameter	Binary value	Condition
T	Temperature	1	Too high
		0	Acceptable
W	Wind speed	1	Too high
		0	Acceptable
R	Rain	1	Detected
		0	Not detected
M	Manual override	1	On
		0	Off

The window opens (**X** = 1) if:

- the temperature is too high **and** the wind speed is acceptable
- and**
- rain is not detected, **or** the manual override is off.

Draw a logic circuit to represent the operation of the window.



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

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

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		

[2]

(c) Embedded systems contain Read Only Memory (ROM) and Random Access Memory (RAM).

Explain the reasons why ROM is used in an embedded system.

.....

.....

.....

.....

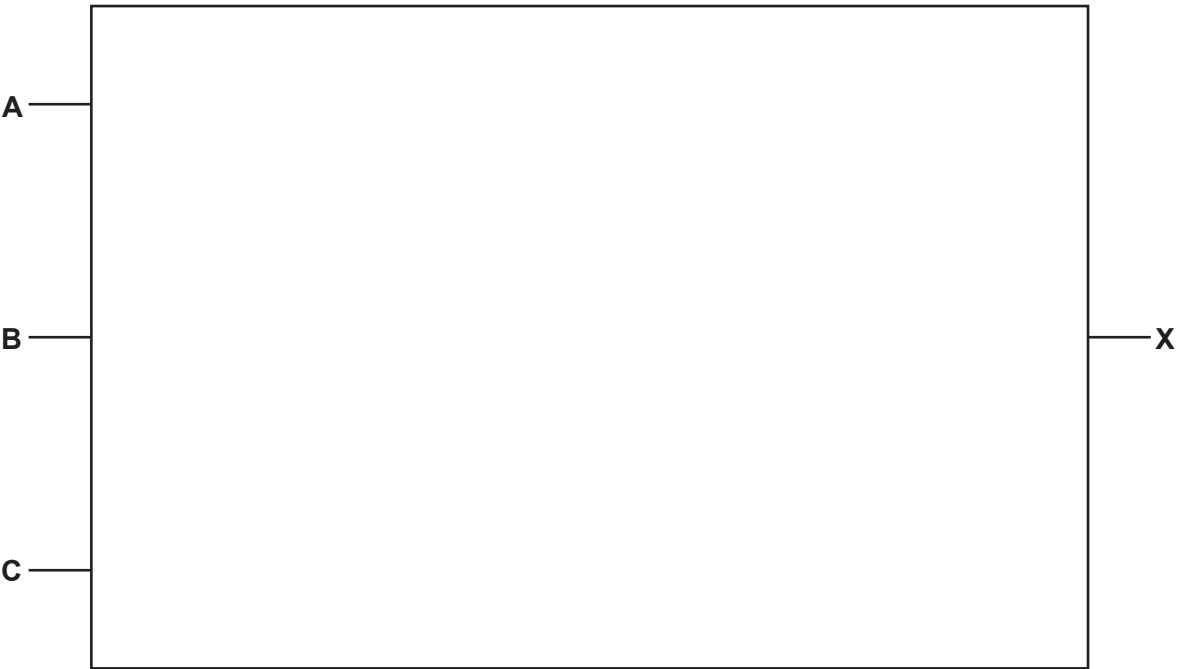
.....

..... [2]

11. Question part 1/2 | 9618 Oct-Nov 2022 P1 V3 Q5

5 (a) Draw a logic circuit for the logic expression:

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



[3]

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

$$Y = (\text{NOT } P \text{ AND } Q) \text{ OR } (Q \text{ AND NOT } R)$$

P	Q	R	Working space	Y
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

[2]

9618 Computer Science Paper 1 - Hardware

Topical questions | 33 questions

11. Question part 2/2 | 9618 Oct-Nov 2022 P1 V3 Q5

Question 6 begins on page 10.

10 (a) Explain the importance of feedback in a control system.

.....

.....

.....

.....

.....

..... [3]

(b) (i) Identify **one** sensor that could be used in a car alarm system.

Justify your choice.

Sensor

Justification

.....

.....

..... [2]

(ii) The car alarm is an example of an embedded system.

Describe the characteristics of an embedded system.

.....

.....

.....

.....

.....

..... [3]

13. Question part 1/2 | 9618 May-June 2023 P1 V1 Q4

4 A networked closed-circuit television (CCTV) system in a house uses sensors and cameras to detect the presence of a person. It then tracks the person and records a video of their movements.

Data from the CCTV cameras is transmitted to a central computer.

(a) This computer has both Read Only Memory (ROM) and Random Access Memory (RAM).

(i) Describe the contents of the ROM in the central computer.

.....

.....

.....

..... [2]

(ii) The central computer has Dynamic RAM (DRAM).

Identify **two** advantages of using DRAM instead of Static RAM (SRAM).

1

.....

2

..... [2]

(b) The central computer stores the video files on secondary storage.

Describe **two** reasons why magnetic storage is more appropriate than solid state storage for this computer.

1

.....

.....

.....

2

.....

.....

..... [4]

- (c) The CCTV system uses Artificial Intelligence (AI) to identify the presence of a person in the house and to track their movements.

Describe how AI is used in this system.

.....

.....

.....

.....

.....

..... [3]

- (d) The CCTV cameras are connected to a network and transfer their data wirelessly to the central computer.

- (i) Each device on the network has an IP address.

Complete the description of IP addresses.

An IPv4 address contains groups of digits. Each group is represented in bits and the groups are separated by full stops.

An IPv6 address contains groups of digits. Each group is represented in bits. Multiple groups that only contain zeros can be replaced with a

[5]

- (ii) The network makes use of subnetting.

Describe **two** benefits of subnetting a network.

1

.....

.....

.....

.....

2

.....

.....

.....

[4]

5 A student has purchased a new laptop.

(a) The laptop is designed using the Von Neumann model for a computer system.

Identify **two** types of signal that a control bus can transfer.

- 1
- 2 [2]

(b) Describe **two** ways the hardware of a laptop can be upgraded to improve the performance **and** explain how each upgrade improves the performance.

- 1 [4]
- 2

(c) Peripherals are connected to the laptop using ports.

(i) A printer is connected to a Universal Serial Bus (USB) port.

Describe how data is transmitted through a USB port.

.....

.....

.....

..... [1]

(ii) A monitor is connected to the laptop using a different type of port.

Identify **one** other type of port that can be used to connect the monitor.

..... [1]

(d) The laptop has systems software.

(i) Describe how the Operating System (OS) manages processes in the computer.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [5]

(ii) Describe the purpose of utility software in a computer.

.....

.....

.....

..... [2]

3 A mobile telephone is used to record a video.

(a) The mobile telephone has a touchscreen. There are different types of touchscreen.

Complete the description of the principal operation of touchscreens.

A touchscreen has two layers. When the user touches the screen, the layers touch and a is completed.

A touchscreen has several layers. When the top layer is touched, there is a in the electric current.

A microprocessor identifies the of the touch.

[5]

(b) The mobile telephone uses a built-in digital camera to record the video.

The digital camera automatically focuses on the faces of people.

Explain how Artificial Intelligence (AI) is used by the camera to automatically focus on the faces of people.

.....

.....

.....

.....

.....

.....

.....

.....

..... [3]

(c) The video includes a sound recording.

(i) Describe how sound is represented in a computer.

.....

.....

.....

.....

.....

..... [3]

(ii) A second video is recorded. The sound in the second video needs to be more precise.

Explain the reasons why increasing the sampling rate and the sampling resolution will improve the precision of the second recording.

Sampling rate
.....
.....
.....

Sampling resolution
.....
.....
.....

[4]

7 (a) Describe the principal operations of a 3D printer.

.....

.....

.....

.....

.....

.....

.....

..... [3]

(b) Describe the purpose of a temperature sensor within the 3D printer.

.....

.....

.....

..... [2]

(c) A 3D printer contains 1 GB of Dynamic RAM (DRAM) to store print data.

State **two** advantages of the printer having Dynamic RAM instead of Static RAM (SRAM).

1

.....

2

.....

[2]

9 (a) Explain the importance of feedback in a control system.

.....

.....

.....

..... [2]

(b) Give **one** example of an embedded system **and** explain why it is an example of an embedded system.

Example

.....

Explanation

.....

.....

.....

.....

.....

..... [3]

18. Question part 1/2 | 9618 Oct-Nov 2023 P1 V2 Q1

1 A factory makes chocolate bars.

The factory uses a conveyor belt that moves the products from one stage of production to the next stage.

(a) An automated system counts the number of chocolate bars made at the end of production.

The system includes a sensor positioned above the conveyor belt.

Identify **one** appropriate type of sensor that can be used.

..... [1]

(b) A second automated system removes chocolate bars with an incorrect weight from the production line.

Describe the role of an **actuator** in this second system.

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

(c) The factory has many different machines with embedded systems.

(i) Identify **two** features of embedded systems.

1
.....
2
..... [2]

(ii) Identify **one** drawback of embedded systems.

.....
..... [1]

BLANK PAGE

7 A laptop computer has Static RAM (SRAM).

A virtual reality headset and a laser printer are connected to the laptop.

(a) Explain why Static RAM is used in the laptop instead of Dynamic RAM.

.....

.....

.....

..... [2]

(b) Identify **two** reasons for using Electrically Erasable Programmable ROM (EEPROM) in a virtual reality headset.

1

.....

2

..... [2]

(c) Describe how the laser printer makes use of a buffer.

.....

.....

.....

.....

.....

.....

.....

..... [4]

(d) Identify **one** port that could be used to connect the virtual reality headset to the laptop.

Justify your choice.

Port

Justification

.....

.....

.....

[3]

- 2 A video doorbell is attached to the front door of a house. The doorbell uses a motion sensor to detect when a visitor walks in front of the door. When the motion sensor is activated:
- The digital camera in the doorbell starts recording a video.
 - A message is transmitted to a smartphone so that the person who lives in the house can watch the video.

The doorbell also has a button that can be pressed. When the button is pressed, a message is transmitted to a smartphone to play the doorbell sound.

The videos are stored on the doorbell’s internal secondary storage device and overwritten when the secondary storage device is full.



- (a) The video doorbell can be considered an example of an embedded system.

Identify **two** characteristics of the doorbell that suggest it is an embedded system.

1

2

[2]

- (b) State whether the video doorbell is a monitoring system or a control system.
Justify your choice.

Monitoring or control system

Justification

.....

.....

.....

.....

[2]

(c) The video doorbell has both primary memory and secondary storage.

(i) Identify **two** items of data that the video doorbell will store in primary memory.

1

.....

2

.....

[2]

(ii) The video doorbell has a solid state (flash) secondary storage device.

Complete the table by writing the answer or answers to each statement about the principal operation of solid state (flash) memory.

Statement	Answer
the two types of logic gate that can be used to create solid state devices	1 2
the number of transistors contained in each cell	
the type of gate that can retain electrons without power	
the type of gate that allows or stops current from passing through	

[4]

(iii) The video doorbell uses a buffer.

Describe how the video doorbell will use the buffer.

.....

.....

.....

.....

[2]

(d) The digital camera has a microphone which is used to record the sound for the video.

The user changes the sampling rate that the microphone uses from 44.1 kHz to 88.2 kHz.

Describe how this change in sampling rate will affect the performance of the video doorbell.

.....

.....

.....

.....

.....

..... [3]

(e) The video doorbell allows both real-time and on-demand bit streaming.

(i) State what is meant by bit streaming.

.....

..... [1]

(ii) Give **two** differences between real-time and on-demand bit streaming.

1

.....

.....

2

.....

..... [2]

21. Question part 1/2 | 9618 May-June 2024 P1 V2 Q2

2 A computer game is being designed that users will be able to play using a virtual reality (VR) headset.

(a) Complete the description of the principal operation of a VR headset.

A headset can have one or two that output the image to the user. The headset has speakers that output surround sound to give a realistic experience. The user’s head movements are detected using a sensor. This sensor is a The data is transmitted to a microprocessor that analyses the data to identify the of movement. Some headsets use that record the user’s eye movements for analysis.

[4]

(b) The computer uses a buffer when transmitting data to the VR headset.

Explain how a buffer is used when data is transmitted between the computer and the VR headset.

.....
.....
.....
.....
.....
..... [3]

(c) The VR headset has Electrically Erasable Programmable Read Only Memory (EEPROM).

Explain the benefits of using EEPROM instead of other types of Read Only Memory (ROM) in the VR headset.

.....
.....
.....
.....
..... [3]

(d) The computer can transmit a video made from bitmap images and vector graphic animations to the VR headset.

(i) Describe how the data for a bitmapped image is encoded.

.....

.....

.....

.....

.....

..... [3]

(ii) Describe the contents of a vector graphic drawing list.

.....

.....

.....

..... [2]

(iii) The bitmap video is **not** compressed before transmission to the VR headset.

Give **two** reasons why the video does **not** need to be compressed.

1

.....

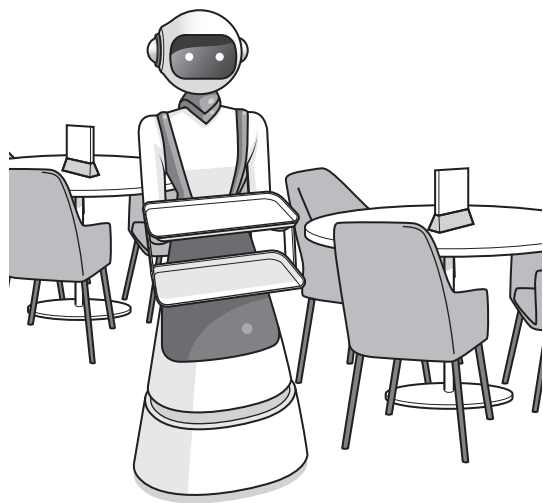
2

.....

[2]

22. Question part 1/4 | 9618 May-June 2024 P1 V3 Q7

7 Robots are used to serve food and drink to customers at a restaurant.



(a) A robot navigates through the restaurant to the table it is serving.

Complete the table by identifying **two** sensors that can be included in the robot **and** the purpose of each sensor in the navigation system.

Sensor	Purpose of sensor in navigation system
.....	
.....	

[2]

(b) The robot uses Artificial Intelligence (AI) to communicate with the customers. The customers speak to the robot to order their food and drinks.

Explain how AI will be used in this part of the robot.

.....

.....

.....

.....

.....

.....

.....



(c) The navigation system can be considered an example of a control system.

Describe how feedback is used in a control system.

.....

.....

.....

..... [2]

(d) The robot includes a touchscreen for the customer to make their payment.

Describe the principal operation of a touchscreen.

.....

.....

.....

.....

.....

.....

.....

..... [4]



(e) Program libraries were used when writing the robot’s software.

(i) State what is meant by a **program library**.

.....

..... [1]

(ii) Some program libraries include Dynamic Link Library (DLL) files.

Describe the benefits of a programmer using a library with DLL files instead of using a library that does not include DLL files.

.....

.....

.....

.....

.....

.....

.....

..... [4]



- (f) The data from the robots is transmitted to a central computer using a wireless connection.
- (i) Complete the table by identifying **and** describing **two** methods of data verification that can be used during data transfer.

	Method	Description
1		
2		

[4]

- (ii) Explain how encryption can protect the security of data during transmission.

.....

.....

.....

.....

[2]

5 A security system has both a floodlight (very bright light) and an audio alarm.

The data from multiple sensors is analysed and used to:

- turn on the floodlight
- sound the audio alarm.

Sensors can be used to detect:

- if doors are open
- the external daylight level
- if people are detected within a set distance.

(a) Complete the table to identify the most appropriate type of sensor for each scenario.

Scenario	Type of sensor
A door is open.	
The external daylight level is below a set amount.	
A person is detected within 2 metres.	

23. Question part 2/2 | 9618 Oct-Nov 2024 P1 V1 Q5



(b) The floodlight (X) and audio alarm (Y) operate according to the following criteria:

Parameter	Description of parameter	Binary value	Condition
A	external daylight level	1	Low
		0	High
B	front door	1	Open
		0	Closed
C	person is within 2 m	1	Detected
		0	Not detected
D	back door	1	Open
		0	Closed
E	security system	1	Switched on
		0	Switched off

The floodlight turns on (X = 1) if:

- the security system is switched on
and
- the external daylight level is low
and
- a person is detected within 2 m.

The audio alarm turns on (Y = 1) if:

- the security system is switched on
and
- one or more doors are open, or a person is detected within 2 m.

Write logic expressions for the security system.

X = ...

.....

Y = ...

.....

[2]

(c) Explain whether the security system is an example of a monitoring system or a control system.

.....

.....

.....

.....

.....

.....

[3]

2 Embedded systems are used in many electronic devices.

(a) Describe the drawbacks of embedded systems.

.....

.....

.....

.....

.....

..... [3]

(b) An embedded system has Dynamic RAM (DRAM).

Identify **one** benefit of using DRAM instead of Static RAM (SRAM) in an embedded system.

.....

..... [1]

(c) Give **two** differences between Erasable Programmable ROM (EPROM) and Electrically Erasable Programmable ROM (EEPROM).

Difference 1

.....

.....

Difference 2

.....

..... [2]

25. Question | 9618 Oct-Nov 2024 P1 V2 Q9

9 A road bridge has a weight limit and a height limit for vehicles. For example, a vehicle must weigh less than 10 000 kg and must have a height of less than 3 m.

The bridge has a warning system. If a vehicle is approaching the bridge and it exceeds one or both limits, a sign displays a warning telling the driver of the vehicle to stop.

(a) The bridge warning system uses sensors to detect if a vehicle exceeds the limits.

Complete the table by identifying **two** different sensors that could be used by the system **and** describe how each sensor is used by the system.

Sensor	Use in bridge warning system
.....	
.....	

[2]

(b) Explain whether the bridge warning system is an example of a monitoring system or of a control system.

.....

.....

.....

..... [2]

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.

26. Question | 9618 Oct-Nov 2024 P1 V3 Q2

2 A memory buffer uses Dynamic RAM (DRAM).

(a) Identify **two** differences between DRAM and Static RAM (SRAM).

Difference 1
.....
.....

Difference 2
.....
.....

[2]

(b) Explain how a memory buffer is used when a computer is transferring data to its magnetic hard disk drive.

.....
.....
.....
.....
.....
.....
.....
.....
..... [4]

3 A car has an automatic braking system.

A sensor is used to measure the distance to objects that are in front of the car.

The car automatically brakes if an object is too close to the front of the car or the distance between the car and the object is decreasing too quickly. The closer the object is to the front of the car, the harder the car brakes so that the car slows down more quickly.

Explain the reasons why the automatic braking system of the car is a control system.

.....

.....

.....

.....

.....

.....

..... [3]

28. Question | 9618 May-June 2025 P1 V1 Q4

4 A shop installs a new system that allows users to purchase items without going through a manual checkout.

The new system:

- identifies customers when they enter the shop and matches them to their account
- prevents a customer from walking through the automatic barriers if they do not have an account
- automatically detects the items that a customer has taken from a shelf and charges these to the customer's account.

(a) The new system uses digital cameras and Artificial Intelligence (AI) to identify the customers.

Explain how the new system uses AI to identify each customer.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(b) The new system uses sensors to identify the items taken from a shelf.

Identify **one** type of sensor that can be used in this new system.

State how the sensor can be used to identify the items taken from a shelf.

Sensor

Use

..... [2]

29. Question part 1/2 | 9618 May-June 2025 P1 V1 Q6

6 A programmer is buying a new computer.

(a) The programmer is considering the following two computers:

Computer 1	Quad-core 2.2 GHz processor 16-bit architecture 1 GB Random Access Memory (RAM) 500 GB magnetic hard disk
Computer 2	Dual-core 3.8 GHz processor 32-bit architecture 2 GB RAM 500 GB solid state drive (SSD)

(i) Computer 1 has a magnetic hard disk.

Complete the description of the principal operation of a magnetic hard disk by writing the missing words.

The magnetic hard disk has one or more that can be magnetised. These are mounted on a and rotate at high speed.

A is moved across the surface on an arm.

When data is read, the changes in the produce a change in the electric current.

[4]

(ii) The two computers have different amounts of RAM.

Explain how different amounts of RAM affect the performance of a computer.

.....

.....

.....

.....

.....

..... [3]

Topical questions | 33 questions



[2]

[5]

30. Question | 9618 Oct-Nov 2025 P1 V1 Q6

- 6 (a) The processor uses several registers, including the Accumulator (ACC) and the Current Instruction Register (CIR).

Complete the table by describing the role of each register.

Register	Role
ACC	
CIR	

[2]

- (b) Increasing the number of cores in a processor can affect the performance of a computer.

Describe the drawbacks of increasing the number of cores in a processor.

[2]

- (c) State **three** differences between Dynamic RAM (DRAM) and Static RAM (SRAM).

1

2

3

[3]

31. Question | 9618 Oct-Nov 2025 P1 V1 Q9

9 Describe the differences between a monitoring system and a control system.

.....

.....

.....

.....

.....

..... [3]

10 An architect needs a model of a building.

(a) Explain how the model will be printed using a 3D printer.

.....

.....

.....

.....

.....

..... [3]

(b) State why a 3D printer needs a buffer.

.....

..... [1]

33. Question | 9618 Oct-Nov 2025 P1 V2 Q11

11 An automated system opens doors when a person is detected within 2 metres. The system closes the doors when there is no longer a person within 2 metres.

Identify whether the automated system is an example of a monitoring system or a control system.

Justify your choice.

Monitoring or Control

Justification

.....

.....

.....

.....

..... [3]

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.