0 1 ROM is a type of memory used in computers.

Shade **two** lozenges to show which statements are true about ROM.

[2 marks]

A Desktop computers usually store application software in ROM ⬭

B Desktop computers typically have more ROM than RAM ⬭

C ROM is commonly used to store start-up instructions ⬭

D ROM is non-volatile ⬭

E ROM is used to increase the quality of graphics on a computer ⬭

0 2 Explain how a magnetic hard disk drive (HDD) operates.

[4 marks]

0 3 . 1 State **three** components of the CPU and describe their purpose.

[6 marks]

Component 1: _____

Description: _____

_____

_____

_____

Component 2: _____

Description: _____

_____

_____

_____

Component 3: _____

Description: _____

_____

_____

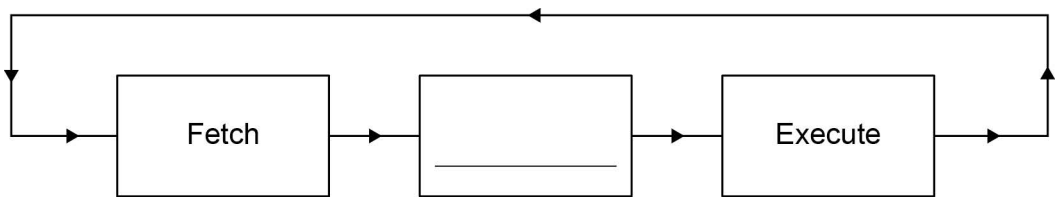
_____

0 3 . 2 **Figure 4** shows a simplified diagram of the Fetch-Execute cycle.

Fill in the name of the missing stage in **Figure 4** below.

[1 mark]

Figure 4



0 4 Computer users will often store their data 'in the cloud'. State **three** reasons why you might want to use cloud storage rather than local storage.

[3 marks]

Turn over for the next question

0 5 Which **two** of the following are components of a CPU?

Shade **two** lozenges.

[2 marks]

A Arithmetic logic unit ⬭

B Control unit ⬭

C Fan ⬭

D Hard disk drive ⬭

E Keyboard ⬭

F Power supply unit ⬭

0 6 Select the **correct** statement about secondary storage.

Shade **one** lozenge.

[1 mark]

A Secondary storage is a type of ROM. ⬭

B Secondary storage is non-volatile. ⬭

C Secondary storage is temporary. ⬭

D Secondary storage loses its content when it is turned off. ⬭

0 7 Describe how an optical disk is read.

[4 marks]

0 8 Define the term **embedded system**.

[2 marks]

0 9 Specifications for two different devices are shown in **Figure 5**.

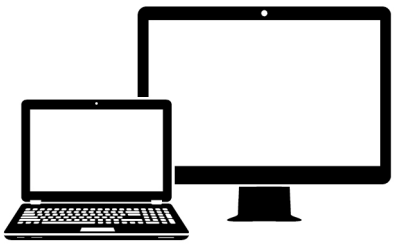
Discuss the advantages and disadvantages of **Device A** compared to **Device B**.

Your answer should explain the impact each advantage/disadvantage will have on the operation of the device.

You should assume that any aspects of the specifications **not** mentioned in **Figure 5** are the same for both devices.

[12 marks]

Figure 5



Device A	Device B
Quad (4) core 1.6 GHz CPU with 8 MB cache	Dual (2) core 3.9 GHz CPU with 2 MB cache
16 GB RAM	4 GB RAM
2 TB Hard Disk Drive (HDD)	250 GB Solid State Drive (SSD)

1 0 Shade **three** lozenges to show which of the following are essential components of the Von Neumann architecture.

[3 marks]

A BIOS ⬭

B Control unit ⬭

C Keyboard ⬭

D Memory ⬭

E Movement sensor ⬭

F Multiple cores ⬭

G Network socket ⬭

H Shared bus ⬭

1 1 . 1 Main memory is any form of memory that is directly accessible by the CPU, except for cache and registers.

Explain how main memory is used.

[3 marks]

1 1 . 2 The cost and physical size of RAM and secondary storage are normally different.

Describe **two** other differences between RAM and secondary storage.

[2 marks]

1 _____

_____

2 _____

_____

1 2 State **two** reasons why computers have more RAM than cache memory.

[2 marks]

1 _____

_____

2 _____

_____

1 3 . 1 Data is increasingly being stored 'in the cloud'.

State **two** advantages of using cloud storage instead of local storage.

[2 marks]

1 _____

_____

2 _____

_____

1 3 . 2 Many new computers use solid-state storage for secondary storage rather than magnetic storage.

Explain why solid-state storage is **not** fitted to every new computer.

[2 marks]

_____

_____

_____

_____

1 4 . 1 Define the term **hardware**.

[1 mark]

1 4 . 2 Describe the role of each of the following components of a CPU:

[3 marks]

Clock

Control unit

Register

1 4 . 3 Give **one** reason why a CPU with **two** cores might perform faster than an equivalent CPU with only one core.

[1 mark]

1 4 . 4 Define the term **non-volatile memory**.

[1 mark]

1 4 . 5 Give **one** example of a type of **volatile** memory in a computer system.

[1 mark]

1 4 . 6 Explain why secondary storage is required in a computer system.

[2 marks]

Turn over for the next question

1 5 . 1 Explain the role of main memory in the **execute** stage of the Fetch-Execute cycle.

[2 marks]

1 5 . 2 Describe the other **two** stages of the Fetch-Execute cycle.

[2 marks]

Fetch stage

Decode stage

1 6 Bob purchases a 4GB SD card for use as secondary storage in his phone.

1 6 . 1 Calculate how many megabytes there are in 4GB. Show your working.

[2 marks]

1 6 . 2 An SD card is a type of solid state storage.

State **two** advantages of solid state storage compared to magnetic storage.

[2 marks]

1 6 . 3 Many modern desktop computers have both solid state drives and magnetic hard disk drives.

Give **two** reasons why desktop computers have a magnetic hard disk drive and a solid state drive instead of having just a solid state drive.

[2 marks]

1 6 . 4 Describe how data is stored on, and read from, a magnetic hard disk.

[4 marks]

Turn over for the next question

16.5 In recent years, there has been a large growth in the use of cloud storage.

Discuss the advantages and disadvantages of using cloud storage.

In your answer you should include an explanation of the reasons for the large growth in recent years and consider any legal, ethical and environmental issues related to the use of cloud storage. **[9 marks]**

1 7 Many computers use the Von Neumann architecture.

1 7 . 1 In a computer that uses the Von Neumann architecture, bit patterns can be stored in the main memory. Shade the correct lozenge to indicate what these bit patterns could represent. You should only shade **one** lozenge.

[1 mark]

A Data ⬭

B Instructions ⬭

C Data and instructions ⬭

D Data or instructions, but not both ⬭

1 7 . 2 Five components of a CPU are given below. For each row in **Table 1**, choose the letter **A**, **B**, **C**, **D**, **E** that best matches the description.

Letters should not be used more than **once**.

A. Bus
B. Arithmetic Logic Unit
C. Control Unit
D. Clock
E. Register

[3 marks]

Table 1

Description	Letter
Sends a continuous series of electronic pulses	
Decodes the current instruction	
Completes calculations	

1 8 . 1 Three major components of a Central Processing Unit (CPU) are:

- control unit
- clock
- cache.

Describe the function of **each** of the three components.

[6 marks]

Control unit _____

Clock _____

Cache _____

1 8 . 2 Explain **three** ways to improve the performance of a CPU.

[3 marks]

1 _____

_____

2 _____

_____

3 _____

_____