Unit 1: Components of a Computer
(1c. Input, Output and Storage)

Marks: /34

Answer **all** the questions.

1.   The office workers of a large company each use a stand-alone computer.

The finance manager needs to work on some files at home and also to assess new software for use in the finance department.

State **three** different storage devices that the finance manager would use and describe what each device would be used for.

1

2

3

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[6]

2.   * Modern computers tend to have magnetic or solid state (flash) hard drives. Discuss which hard drive you would recommend for a keen video games player to use on their desktop PC.

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                                                                           [9]
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3.   Computer software is used in Geography lessons to teachstudents about weather systems.

Describe how the following forms of output will be used by the software.

(i) Animation

-- **[2]**

(ii) Interactive presentation

-- **[2]**

4.   Intensive Care Units in hospitals are for patients in need of round the clock monitoring and support. Computerised systems can be used to monitor patients' vital signs (temperature, heart rate, blood pressure and breathing). They can then alert medical professionals to any significant changes.

   These systems usually run on an embedded, real-time, operating system.

   (i) Explain two advantages of this monitoring system having its operating system stored in ROM.

   --[2]

   (ii) The monitoring system also has RAM. Describe what happens to the contents of RAM and ROM when power to the monitoring system is removed.

   --[2]

5.   The memory of a computer system contains both RAM and ROM.

(i) State **two** differences between RAM and ROM in a typical PC computer system.

1

2

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[2]

(ii) State **one** item that needs to be stored in RAM and give a reason why RAM is used.

---[2]

(iii) State **one** item of software that is stored in ROM and give a reason why ROM is necessary.

---[2]

6. People burn calories as they move around. 'FitFeet' trainers come with an attachable device. This device estimates the calories burnt by the user whilst wearing the trainers. Users can then upload this information to their computers.

The device stores its data on flash memory. Explain why flash storage would be more appropriate than a magnetic hard drive for this device.

---[3]

7. A professional photographer, Sarah, takes and edits photographs for magazines.

Sarah carries around a digital camera and laptop to use on shoots. She keeps extra peripherals in her office that she can use when editing and finalising photographs.

Name an output device Sarah may have in her office and describe what she might use it for.

---[2]

END OF QUESTION PAPER

Question			Answer/Indicative content	Marks	Guidance
1			• Hard drive… • …to store files and software • Removable hard drive… • …to store archive of files • CDROM/DVDROM reader… • …for the importation of software • Memory stick / solid state device… • …to allow transport of materials between office and home • CD(R)/DVD(R) (reader / writer…) / optical disk • …to store back-up of files / software / portability of files • Cloud storage… • …to make files available to others in the dept / from anywhere / on any device / backup	6	Mark as three pairs of marks. Second mark is dependent on getting the first Uses are all examples, other sensible uses should be credited. Uses can be generic, but if specific they need to be about the finance manager Not: USB on its own Only allow the same reason once e.g. 'to store files' **Examiner's Comments** The intention of the question was to make candidates consider hardware choices in a simple scenario. The list of accepted answers is shown in the published markscheme. Almost any device was accepted if the candidate could come up with a sensible reason for its use, although devices like floppy disk drives were not sensible devices for use by a finance manager in a firm. 'Magnetic tape' was a relatively popular response which was not accepted on the basis that it did not describe a device, but a 'magnetic tape drive' to store archive material was considered sensible.
			Total	6	

Question			Answer/Indicative content	Marks	Guidance
2			**Mark Band 3–High Level (7–9 marks)** The candidate demonstrates a thorough knowledge and understanding of Magnetic and Flash storage. The material is generally accurate and detailed. The candidate is able to apply their knowledge and understanding directly and consistently to the context provided. Evidence / examples will be explicitly relevant to the explanation. The candidate provides a thorough discussion which is well balanced. Evaluative comments are consistently relevant and well-considered. *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.* **Mark Band 2–Mid Level (4–6 marks)** The candidate demonstrates reasonable knowledge and understanding of a Magnetic and Flash based storage; the material is generally accurate but at times underdeveloped. The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence / examples are for the most part implicitly relevant to the explanation. The candidate provides a sound discussion, the majority of which is focused. Evaluative comments are for the most part appropriate, although one or two opportunities for development are missed. *There is a line of reasoning presented with some structure. The information presented is in the most part relevant and supported by some evidence.* **Mark Band 1–Low Level (1–3 marks)** The candidate demonstrates a basic	9	**AO1: Knowledge and Understanding** The following is indicative of possible factors / evidence that candidates may refer to but is not prescriptive or exhaustive: – Magnetic hard drives work by magnetic patterns being read off platters that mechanically spin at high speeds. – Flash hard drives use memory chips. These can have their contents erased and subsequently overwritten when an electrical charge is applied. – Magnetic hard drives are cheaper per GB and tend to be sold in much higher capacities than flash hard drives. – Flash hard drives tend to have much higher read / write speeds than magnetic hard disks. – Flash hard disks have no moving parts and therefore tend to have lower power consumption and are not affected by their device moving. **AO2.1: Application** The selected knowledge / examples should be directly related to the specific question. The following is indicative of possible factors / evidence that candidates may refer to but is not prescriptive or exhaustive: – Many games tend to incorporate a lot of media and as such a keen gamer is likely to need a lot of storage space. – Games are fast paced and often competitive. High loading speeds can be beneficial. – High performance is often important to gamers and as such will pick highest performing components. – Hybrid approaches exist which offer 'the best of both worlds'. – Magnetic hard drives can be noisy (due to parts moving at high speed), this can be undesirable and distracting whilst gaming. Conversely flash drives operate silently.

Question			Answer/Indicative content	Marks	Guidance
			knowledge of Magnetic and Flash based storage with limited understanding shown; the material is basic and contains some inaccuracies. The candidate makes a limited attempt to apply acquired knowledge and understanding to the context provided. The candidate provides a limited discussion which is narrow in focus. Judgements if made are weak and unsubstantiated. *The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.* **0 marks** No attempt to answer the question or response is not worthy of credit.		**AO3.3: Evaluation** Candidates will need to consider a variety of issues in relation to the question and will make some evaluative comments about the issues and solutions they are discussing. The following is indicative of possible factors / evidence that candidates may refer to but is not prescriptive or exhaustive: – Due to their high storage capacity magnetic hard disks are the best choice. A gamer could have many games installed at one time. Whilst performance is not quite that of flash drives, to have a similarly sized flash drive would be prohibitively expensive. A high quality magnetic drive will provide good enough performance leaving money to be spent elsewhere. As it is being installed on a desktop there is no need to worry about power consumption or issues with the computer moving. – Gamers need high performance and that includes large amounts of data being loaded quickly. The read / write speed of a solid state drive means this is the natural choice for the gamer's desktop.
			Total	9	

	Question		Answer/Indicative content	Marks	Guidance
3		i	• Movement of images on the screen • Used to illustrate weather systems which would otherwise not be possible	2	Two mark points are: Movement and weather systems **Examiner's Comments** Some good answers but many simply rewrote the words in the question on the linesof 'An animation is when images are animated.' Responses needed to refer to the scenario to earn full marks. Nothing complicated was expected, for example 'moving images to show how a weather system develops' would earn two marks.
		ii	• The next image / stage presented is determined by the input determined by the user • Questions may be asked about one stage and the software will move to a next stage determined by the response to the question given	2	Two mark points are: Output determined by student input and an example (eg question asked and answered or hyperlink / hot button chosen) **Examiner's Comments** It was important to indicate that the output from the software would be influenced by the input from the student even if it was only indicating whether answers to questions were correct or not.
			Total	4	
4		i	• ROM is quick to start up so the system can be started up quickly (in an emergency) (1). • ROM cannot be altered so there is no chance of the OS being accidentally or maliciously changed (on what is a safety critical system) (1).	2	Up to 2 marks for valid identification and description that demonstrates application of knowledge and understanding to given context.
		ii	• The contents of RAM are wiped (1) whereas the contents of ROM remain the same (1).	2	Up to 2 marks for a valid description.
			Total	4	

Question			Answer/Indicative content	Marks	Guidance
5		i	–RAM is volatile / ROM is not volatile –RAM is editable / ROM cannot be altered –RAM is larger / ROM is smaller (1 per –, max 2)	2	**Examiner's Comments** This question was well answered; most candidates could give two differences between RAM and ROM.
		ii	–User files / software / OS currently in use –User must be able to alter contents of file / computer needs access to software but needs to be able to replace it – RAM offers direct access. – RAM operates at a much faster speed than most secondary storage devices.	2	1 mark per item, one mark per reason **Examiner's Comments** Most candidates could state a valid item that is stored in RAM but did not go on to say 'currently in use' therefore did not gain full credit.
		iii	–Boot file / program / BIOS –Must be available when computer switched on (therefore must be stored on medium which is non–volatile) – The boot program / BIOS must not be deleted / unintentionally amended (and therefore is best stored on a read–only medium.)	2	1 mark per item, one mark per reason **Examiner's Comments** Common answers were BIOS and Bootstrap, with some candidates incorrectly stating that data files are held in ROM.
			Total	6	
6			• Device is likely to undergo lots of sudden movement (1 – AO1.2) magnetic hard drives can be susceptible to damage if moved quickly (1 – AO3.3) due to the head coming into contact with the platter (1 – AO3.3) whereas flash memory has no moving parts and so is not affected (1 – AO3.3). • The device is likely to be small (1 – AO1.2) – hard drives require enough space for their moving parts (1 – AO3.3) whereas flash memory, having no moving parts, requires much less space (1 – AO3.3).	3	Up to 3 marks for a valid explanation. Allow maximum 1 mark for mention that little data is needed and so large capacity of magnetic storage not needed. Maximum 1 mark for demonstrating understanding (AO1.2). Up to 2 marks for evaluation (AO3.3).
			Total	3	

Question			Answer/Indicative content	Marks	Guidance
7			▢ A printer [1]… ▢ … to print (hard copies) of photographs / relevant documentation [1] OR ▢ A monitor [1] … ▢ …which may be of a larger size / higher quality than that on her laptop making editing easier. [1]	2	Accept any output device if accompanied by a sensible justification.
			Total	2	