1	1	**Marks are for AO1 (understanding)** Magnetic disk drives are useful where large capacity is needed (without the cost of very large SSDs); Solid state disk drives have faster access speeds/lower latency than magnetic disk drives (which is useful for loading frequently used software) // access to data would be faster than if just magnetic disk drive was used; **R.** Faster by itself **Max** 1 if just differences are given rather than benefits of having both.	2
1	2	**Marks are for AO1 (understanding)** No movable parts (so no need for the read/write heads to move to the correct position); Purely electronic (so minimal latency);	2

2	1	**2 marks are for AO1 (understanding) and 2 marks are for AO2 (analyse)** **Mark as follows:** • SSDs have lower power drain; which is important as the life blogger will run on battery; • SSDs are less likely to be damaged if dropped; which is important as the devices will be worn and carried around; • SSDs have faster access time; which could allow more data to be stored per second (which may allow finer detail); • SSDs are silent; which means they will not disturb the users; • SSDs are lighter/less obtrusive/smaller; which is important for a device worn around the neck; • SSDs produce less heat; which makes them more comfortable to wear; **Max 2** for advantages **Max 2** for expansions **Max 4 marks**	4

Qu	Pt	Marking Guidance	Marks
3		**Marks are for AO2 (Analyse)** RFID tags are small/lightweight, making them easy to carry/integrate with Staff ID cards; RFID tags are cheap, making it more affordable to provide them to as many staff members as necessary; RFID tags are durable, making them more reliable over time / in emergency situations; RFID tags do not require their own power sources, making them more reliable / lower maintenance; RFID tags can be read quickly, making it suitable for access in emergency situations; RFID tag has storage, which could be used to store access credentials // no need to remember a keypad code // different staff could be given different access levels; RFID permits contactless access, allowing access where staff do not wish to touch a communal access control mechanism; **MAX 3** If no other marks awarded allow 1 mark for at least 2 reasons why RFID is used in this scenario, or at least 2 characteristics of RFID (with no reference to the scenario).	3

Qu	Pt	Marking Guidance	Marks
4	1	**Marks are for AO1 (understanding)** The RFID reader emits radio waves; (The antenna in the RFID tag allows) the radio waves to induce sufficient power in the tag to enable/power the tag // triggers an active tag; Data is stored on the chip/memory of the tag; In response the tag emits radio waves to transmit the data on the tag to the RFID reader; **A.** Frequency or signal for radio waves **Note:** Accept references to data, instead of radio waves, if it is made clear somewhere in the response that radio waves/signals/frequencies are being used. **Max 3**	3

Qu	Pt	Marking Guidance	Marks
4	2	**Marks are for AO1 (understanding)** Passive tags are smaller // are more convenient for users to carry; (As passive tags can only be read when close to the reader) it is less of a security risk // it is more difficult to intercept/steal the data from the passport; Using passive tags is likely to be cheaper than using active tags (especially at a national scale); In passive tags there is no need to replace/charge battery // in active tags battery may not last as long as the passport is valid; Accept points made as disadvantages of active tags or as advantages of passive tags **Max 2**	2

<table>
<tr><th>Qu</th><th>Pt</th><th>Marking Guidance</th><th>Marks</th></tr>
<tr><td>5</td><td></td><td>

6 marks are for AO1 (understanding)
6 marks are for AO2 (analyse)

Level of response question:

<table>
<tr><th>Level</th><th>Description</th><th>Mark Range</th></tr>
<tr><td>3</td><td>A line of reasoning has been followed to produce a coherent, relevant, substantiated and logically structured response. Answers in this level will demonstrate a clear and detailed awareness of the properties of solid-state drives. The response covers a wide range of issues and is likely to cover the moral ethical, legal and cultural aspects of the question. Several of the points made will have been expanded upon using clear examples and references to real-world implications.</td><td>9–12</td></tr>
<tr><td>2</td><td>A line of reasoning has been followed to produce a mostly coherent, relevant, substantiated and logically structured response. Answers in this level will identify a small number of properties of solid-state drives but may fail to develop points. The response is likely to cover at least two of moral, ethical, legal and cultural aspects of the question. Some of the points made may have been expanded on.</td><td>5–8</td></tr>
<tr><td>1</td><td>There is little evidence that a line of reasoning has been followed. Answers in this level may identify some properties of solid-state drives. Answers may have attempted to identify some moral, ethical, legal and cultural issues. Points are not likely to be expanded upon but where they are, the examples may not be relevant or not relate to the points being made.</td><td>1–4</td></tr>
</table>

Indicative content

<u>Area 1:</u> Moral, ethical, legal and cultural issues

Moral (individual beliefs)
- There is the potential for the technology to be misused by criminals (eg stalking, tracking partners/children/pets/strangers/property without permission).
- Criminals could put them into the pockets/luggage of targets/victims/children to find out where they live.
- Individuals might become over-reliant on the technology and not look after their property.
- Individuals might not wish for their phones to be used to send signals on behalf of other users or in support of the company's network, even with encryption.

Ethical (society)
- Right to privacy eroded as your movements are tracked by the company.
- "Big Brother" society where your every move is monitored and analysed.
- Could it be used to track people in a good way, for example elderly or ill patients.

</td><td>12</td></tr>
</table>

		• Individuals in some jurisdictions will have had to agree for their phones to relay signals in support of the company's network but they may not want to or even know that they have agreed to such terms. **Legal** • As the tag moves internationally through different countries different laws will exist about data collection and privacy. • Computer Misuse Act would be applied in the UK to prevent unauthorised access to the tag and the location data. • General Data Protection Regulation (GDPR) affords protections to data subjects and provides rights relating to access, accuracy, deletion, etc. **Cultural (subgroups)** • Older people might be very distrustful or fearful of this technology. • This tag would only work in an area with a high number of phones / phone coverage, therefore it is not suitable for rural locations or places with few phone users for other reasons. • Different societies may have different views on the privacy issues related to location tracking. **<u>Area 2</u>: Suitability of storage device** **Solid-state drive properties:** • Higher read and write speeds than hard disks (because there are no moving parts means they'd be more likely to keep up with the requests). • Less prone to (terminal) failure from dropping/collisions/movement (because there are no moving parts or joints), which means there is less likelihood of costs being incurred from damaged drives. • Generally more energy efficient, which can lead to reduced costs (operational and/or cooling), provide a cooler / more comfortable operating environment, and be more environmentally friendly. • Generally small in physical size, which means that the amount of space required to house them / operational cost can be reduced. • More expensive (per bit) for the same amount of memory, (which means that the company would be investing more in the purchase of the drives initially). • The lifetime of a solid-state drive is relatively fixed, due to there being an approximate maximum number of writes before it becomes unreliable/unusable.	