MODULE B MEMORY AND STORAGE · B1

Primary storage, RAM and ROM: mark scheme

~25 minutes · 20 marks · OCR J277 spec 1.2.1

How to use. 1 mark per bullet up to the maximum shown. **/** separates alternative words; **//** separates alternative statements for the same mark. Words in (brackets) are not needed for the mark. "..." links a point to the one before it. Credit any other valid answer that shows the same understanding.

QUESTION	ANSWER	MARKS	GUIDANCE
1(a) J277 1.2.1	(Main) memory that is directly accessed by the CPU // memory that holds the data and instructions currently in use	**1**	Max 1. Accept "RAM, ROM (and cache)" only with a description. Do not accept "storage inside the computer" (NE) or any answer describing long-term storage of files.
1(b) J277 1.2.1	To hold the data / instructions (programs) currently in use / that the CPU needs (e.g. the booking being shown) ... because the CPU can access it directly // the CPU cannot work directly from secondary storage ... it is fast (to access), so the CPU is not kept waiting / the terminal responds quickly To hold the start-up instructions (so the terminal can boot)	**2**	1 mark per bullet, max 2. "Faster" needs a comparison or a consequence (NE alone). Do not accept "when secondary storage is full".
2 J277 1.2.1	Lost when power off: RAM Start-up (boot) instructions: ROM Directly accessed by the CPU: Both CPU can write new data while a program runs: RAM	**4**	1 mark per correct row. 2+ ticks in a row = 0 for that row.
3(a) J277 1.2.1	(Parts of) the operating system (The parts in use of) the check-in program / app The booking reference typed in // the guest's booking details The data for the screen display / the key card to be printed	**2**	1 mark per bullet, max 2. Must be things in use at this moment. Do not accept "all the bookings" / "every program" / "all files". Do not accept "start-up instructions / BIOS" (ROM).

QUESTION	ANSWER	MARKS	GUIDANCE
3(b) J277 1.2.1	The start-up / boot instructions // BIOS / bootstrap (loader) ROM is non-volatile, so the instructions are kept when the power is off // ROM is read only, so the instructions cannot be changed / deleted (by accident)	**2**	1 mark for what, 1 mark for reason. Award the reason mark even if "what" is wrong, as long as the reason is a correct property of ROM. Do not accept "the operating system" for what is stored. Do not accept "ROM is permanent" alone (BOD if linked to no power).
4 J277 1.2.1	RAM is volatile but ROM is non-volatile // RAM loses its contents when power is off, ROM keeps them RAM can be read from and written to but ROM is read only // RAM contents can be changed, ROM contents (normally) cannot RAM holds the programs / data currently in use, ROM holds the start-up instructions RAM usually has a larger capacity than ROM	**2**	1 mark per bullet, max 2. Each difference must give both sides (e.g. "RAM is volatile" alone = 0). Do not accept uses only without a comparison. Accept answers that state one side and clearly imply the other (e.g. "only RAM is volatile").
5(a) J277 1.2.1	To store frequently used data / instructions ... so the CPU does not have to fetch them from RAM (each time) ... because cache is faster to access than RAM // so instructions are processed / fetched faster	**2**	1 mark per bullet, max 2. Do not accept "data just used / about to be used" without "frequently". Do not accept that cache stores files or acts as extra RAM when RAM is full (that is virtual memory).
5(b) J277 1.2.1	It is (directly) accessed by the CPU // it holds data / instructions currently in use by the CPU	**1**	Do not accept "it is inside the computer" or "it is fast" alone (NE).
6 J277 1.2.1	RAM is volatile, so its contents are lost when the power goes off ... (so) the guest's check-in data / booking details (not yet saved) are lost // the check-in must start again ROM is non-volatile, so its contents / the start-up instructions are kept during the power cut When the power returns the CPU runs the start-up / boot instructions from ROM ... which load the operating system (from secondary storage) into RAM	**4**	1 mark per bullet, max 4. For full marks the answer must cover both RAM and ROM. Do not accept "ROM saves the data" or that RAM's contents are moved into ROM. Do not accept that the operating system is loaded from ROM into RAM.

Total: 20 marks