MODULE B MEMORY AND STORAGE · B7

Units of data storage: mark scheme

21 marks · OCR J277 spec 1.2.3

How to use. 1 mark per bullet up to the maximum shown. **/** separates alternative answers. Words in (brackets) are not needed for the mark. The J277 specification (v3.1, 2026) uses 1 KB = 1,000 bytes and states that use of 1,024 for conversions and calculations is acceptable: the 1,024 answers are given in the Guidance column and earn full marks.

QUESTION	ANSWER	MARKS	GUIDANCE
1(a) J277 1.2.3	4 (bits)	**1**	Correct answer only.
1(b) J277 1.2.3	0.5 GB	**1**	0.5 GB = 500 MB; the others are 3 MB, 2 MB and 4 MB. The same box is largest using 1,024. 2+ ticks = 0.
1(c) J277 1.2.3	8 bits = 1 byte 1,000 KB = 1 megabyte / MB 1,000 GB = 1 terabyte / TB 1,000 TB = 1 petabyte / PB	**4**	1 mark per row. Accept full name or abbreviation. Do not accept binary-prefix names (mebibyte / MiB, tebibyte / TiB, pebibyte / PiB): not J277 terms. Lower-case "b" for byte = NE (bit).
2(a) J277 1.2.3	nibble, byte, kilobyte, gigabyte, terabyte, petabyte	**2**	2 marks: all six in the correct order. 1 mark: one pair of neighbouring units swapped, or one unit out of place with the rest in the correct order. Order given largest to smallest = 0.
3(a) J277 1.2.3	32,000 ÷ 8 (= 4,000 bytes) then ÷ 1,000 / 32,000 ÷ 8,000 4 (KB)	**2**	1 mark working, 1 mark answer. Correct answer with no working = 2. Accept 1,024: 4,000 ÷ 1,024 = 3.90625 KB; accept 3.9 / 3.91. Award the working mark for ÷ 8 shown even if the second step is wrong. Do not award the working mark for × 8.
3(b) J277 1.2.3	2,500 (GB)	**1**	2.5 × 1,000. Accept 2,560 (2.5 × 1,024).

QUESTION	ANSWER	MARKS	GUIDANCE
3(c) J277 1.2.3	0.75 (GB)	**1**	750 ÷ 1,000. Accept ¾. Accept 750 ÷ 1,024 = 0.732421875; accept 0.73 / 0.732.
3(d) J277 1.2.3	6 × 1,000 × 1,000 / 6 × 1,000,000 6,000,000 (bytes)	**2**	1 mark working, 1 mark answer. Correct answer with no working = 2. Accept 1,024: 6 × 1,024 × 1,024 = 6,291,456 bytes. Award the working mark for one correct step (6,000 KB / 6,144 KB) if the final answer is wrong.
4(a) J277 1.2.3	2 TB	**1**	1.5 TB is more than 1 TB and less than 2 TB. 2+ ticks = 0.
5(a) J277 1.2.3	Computers are made of (millions of) switches / transistors / logic gates ... which have only two states / on and off Two states can be represented by 1 and 0 / binary (So) all data must be converted to binary for the computer to process / store it	**2**	1 mark per bullet, max 2. "Computers only understand binary" alone = NE.
6(a) J277 1.2.3	One byte = two nibbles: True 1 PB = 1,000 GB: False KB larger than MB: False 1 GB = 1,000,000 KB: True	**4**	1 mark per correct row. 2+ ticks in a row = 0 for that row. Row 2: 1 PB = 1,000 TB = 1,000,000 GB. Row 4: 1 GB = 1,000 MB = 1,000 × 1,000 KB.

Total: 21 marks