MODULE B MEMORY AND STORAGE · B7

Units of data storage: mark scheme

20 marks · Cambridge 0478 syllabus 1.3.1

How to use. One mark per creditworthy point up to the maximum shown. **/** separates alternative words; **//** separates alternative answers. Words in (brackets) are not needed for the mark. The 0478 syllabus (2026-2028) uses 1 KiB = 1024 bytes and each unit is 1024 of the one before: answers using 1000 are not credited, and answers must be in the units asked for.

QUESTION	ANSWER	MARKS	GUIDANCE
1(a) 0478 1.3.1	8	**1**	Correct answer only.
1(b) 0478 1.3.1	exbibyte // EiB	**1**	Do not accept exabyte / EB.
1(c) 0478 1.3.1	4 (bits) 2 (nibbles) 1024 (KiB) gibibytes // GiB	**4**	1 mark per row. Row 3: do not accept 1000. Row 4: do not accept gigabytes / GB.
2(a) 0478 1.3.1	0.5 GiB	**1**	0.5 GiB = 512 MiB; 2048 KiB = 2 MiB; 4 194 304 bytes = 4 × 1024 × 1024 = 4 MiB. More than one tick = 0.
2(b) 0478 1.3.1	nibble, byte, kibibyte, mebibyte, tebibyte, exbibyte	**2**	2 marks: all six in the correct order. 1 mark: one pair of neighbouring units swapped // one unit out of place with the rest in order. Order given largest to smallest: 0.
3(a) 0478 1.3.1	16 384 / 8 (= 2048 bytes) then / 1024 // 16 384 / 8192 2 (KiB)	**2**	1 mark for working, 1 mark for the answer. Correct answer with no working = 2. Working mark for / 8 even if the second step is wrong. Do not credit / 1000 (2.048 = 1 mark max, for / 8).
3(b) 0478 1.3.1	3072 (MiB)	**1**	3 × 1024. Do not accept 3000.

QUESTION	ANSWER	MARKS	GUIDANCE
3(c) 0478 1.3.1	5 × 1024 × 1024 // 5120 (KiB) × 1024 // 5 × 1 048 576 5 242 880 (bytes)	**2**	1 mark for working, 1 mark for the answer. Correct answer with no working = 2. 5 000 000 = 0.
3(d) 0478 1.3.1	2.5 (GiB)	**1**	2560 / 1024. Accept 2½. Do not accept 2.56.
4(a) 0478 1.3.1	Any two from: 1 KiB is 1024 bytes 1024 is a power of 2 // 1024 = 2^{10} (because) computers store data in binary // each binary place is a power of 2 1000 bytes is a kilobyte (KB), a different unit	**2**	max 2.
5(a) 0478 1.3.1	TiB larger than PiB: False 1 GiB = 1 048 576 KiB: True 8 nibbles in 4 bytes: True	**3**	1 mark per correct row. More than one tick in a row = 0 for that row. Row 2: 1024 MiB × 1024 KiB = 1 048 576 KiB. Row 3: 4 bytes = 32 bits = 8 × 4 bits.

Total: 20 marks