MODULE B MEMORY AND STORAGE · B8

Calculating file sizes: mark scheme

21 marks · OCR J277 spec 1.2.3

How to use. 1 mark per bullet up to the maximum shown. **/** separates alternative words; **//** separates alternative answers. Words in (brackets) are not needed for the mark. In calculations, the working marks are for the stages shown and the last mark is for the correct answer; a correct answer with no working gets full marks. Dividing by 1,024 instead of 1,000 is accepted at any unit step, and an allowance for metadata may be added (both allowed by spec 1.2.3).

QUESTION	ANSWER	MARKS	GUIDANCE
1(a) J277 1.2.3	Image: colour depth × image height (px) × image width (px) Sound: sample rate (Hz) × duration (s) × bit depth Text: bits per character × number of characters	**3**	1 mark per row. Factors in any order. Accept "number of pixels" for height × width; "bits per sample" for bit depth; "length / time (in seconds)" for duration.
1(b) J277 1.2.3	Bits	**1**	Do not accept bytes.
2(a) J277 1.2.3	4 × 400 × 500 // = 800,000 bits ÷ 8 // = 100,000 bytes 100 (KB)	**3**	Full working: 4 × 400 × 500 = 800,000 bits; 800,000 ÷ 8 = 100,000 bytes; 100,000 ÷ 1,000 = 100 KB. Accept 97.65625 / 97.7 / 97.66 (÷ 1,024). Third mark for the correct final answer (a correct answer with no working scores full marks).
2(b) J277 1.2.3	200 (KB)	**1**	8 × 400 × 500 = 1,600,000 bits = 200,000 bytes = 200 KB. FT: double their answer to 2(a). Accept 195.3125 / 195.3 (÷ 1,024).
3(a) J277 1.2.3	16,000 × 25 × 8 // = 3,200,000 bits ÷ 8 // = 400,000 bytes 400 (KB)	**3**	Full working: 16,000 × 25 = 400,000 samples; × 8 = 3,200,000 bits; ÷ 8 = 400,000 bytes; ÷ 1,000 = 400 KB. Accept 390.625 / 390.6 / 390.63 (÷ 1,024).

QUESTION	ANSWER	MARKS	GUIDANCE
4(a) J277 1.2.3	16 × 2,500 // = 40,000 bits ÷ 8 // = 5,000 bytes 5 (KB)	**3**	Full working: 16 × 2,500 = 40,000 bits; ÷ 8 = 5,000 bytes; ÷ 1,000 = 5 KB. Accept 4.8828125 / 4.88 / 4.9 (÷ 1,024). Do not award the first mark for 8 × 2,500 (wrong bits per character).
5(a) J277 1.2.3	One icon: 8 × 50 × 40 // = 16,000 bits // = 2,000 bytes × 10 // = 160,000 bits // = 20,000 bytes (for all 10) 20 (KB)	**3**	Full working: 40 × 50 = 2,000 pixels; × 8 = 16,000 bits; ÷ 8 = 2,000 bytes; × 10 = 20,000 bytes; ÷ 1,000 = 20 KB. Steps may be done in any order. Accept 19.53125 / 19.5 / 19.53 (÷ 1,024). 2 KB (one icon only) scores max 2.
6(a) J277 1.2.3	2 GB = 2,000 MB // 2,000 ÷ 5 400 (photos)	**2**	Accept 409 (2,048 ÷ 5 = 409.6, using 1,024, rounded down). Do not accept 409.6 or 410 for the answer mark (part of a photo cannot be stored). Accept a lower whole number if a stated metadata allowance is used.
6(b) J277 1.2.3	1 mark per bullet, max 2: Metadata is extra data (about the photo) stored in each file // e.g. width, height, colour depth ... so each file is larger (than 5 MB) ... so fewer photos fit (than calculated) // fewer than 400	**2**	Max 2. Do not accept "metadata stores the colour of each pixel". "More photos fit" scores 0.

Total: 21 marks