

1.3 EXCHANGING DATA · 1.3.1

Compression — Mark scheme

34 marks · spec 1.3.1(a)(b)

AO key: AO1 = knowledge & understanding · AO2 = application · AO3 = reasoned judgements. Accept any valid alternative; do not award the same point twice.

Q	ANSWER	AO	MARKS
1(a)	Reducing the number of bits / the size of a file. (1)	AO1	1
1(b)	1 mark each, max 2: faster transfer / download · less bandwidth used · less storage space. (2)	AO1	2
1(c)	Lossless. (1)	AO1	1

Q	ANSWER	AO	MARKS
2(a)	1 mark per point, max 3: • text must be reconstructed exactly / every character matters (1) • lossy would permanently lose data / change the text (1) • lossless is reversible, restoring the original exactly (1)	AO2	3
2(b)	1 mark per point, max 3: • photos can lose some detail without the user noticing (1) • lossy gives a much greater size reduction (1) • so pages load faster / use less bandwidth (1)	AO2	3

Q	ANSWER	AO	MARKS
3(a)	4A5B2C (2). 1 mark if mostly correct with one error.	AO2	2
3(b)	CCCMCC (2). 1 mark if one error.	AO2	2
3(c)	When the data has little/no repetition (1); storing a count for single values adds characters, so the file can grow (1). (2)	AO2	2

Q	ANSWER	AO	MARKS
4(a)	1 mark per point, max 3: - repeating patterns/words are identified (1) - each is stored once in a dictionary with a code/index (1) - occurrences in the data are replaced by the code (1)	AO1	3
4(b)	The codes are meaningless without it (1); the dictionary is needed to look up each code to rebuild the original (1). (2)	AO2	2
4(c)	Text (where whole words repeat). (1)	AO1	1

Q	LEVELS-OF-RESPONSE MARK SCHEME	AO	MARKS										
5	Mark using the levels descriptors below. AO1 (how each method works), AO2 (the data each suits), AO3 (justified choice for text). <table><thead><tr><th>LEVEL</th><th>DESCRIPTOR</th></tr></thead><tbody><tr><td>Level 3 (9–12)</td><td>Accurately explains both methods and the data each suits, clearly applied, leading to a clear justified choice for English text. Well structured.</td></tr><tr><td>Level 2 (5–8)</td><td>Explains both methods with some comparison; a choice is made with partial justification.</td></tr><tr><td>Level 1 (1–4)</td><td>Basic points about one or both methods with little comparison or justification.</td></tr><tr><td>0</td><td>Nothing creditworthy.</td></tr></tbody></table> Indicative content (credit any valid point): • RLE: replaces runs of identical values with count + value; great for long runs (simple images); can enlarge low-repetition data such as text. • Dictionary coding: stores repeating patterns once and replaces occurrences with codes; the dictionary is stored with the data; well suited to text where words repeat. • Both are lossless, so the original is restored exactly. • Justified choice: for English text, dictionary coding is the better choice because RLE rarely finds long runs in text, whereas words repeat and compress well.	LEVEL	DESCRIPTOR	Level 3 (9–12)	Accurately explains both methods and the data each suits, clearly applied , leading to a clear justified choice for English text. Well structured.	Level 2 (5–8)	Explains both methods with some comparison; a choice is made with partial justification.	Level 1 (1–4)	Basic points about one or both methods with little comparison or justification.	0	Nothing creditworthy.	AO1 ×4 AO2 ×4 AO3 ×4	12
LEVEL	DESCRIPTOR												
Level 3 (9–12)	Accurately explains both methods and the data each suits, clearly applied , leading to a clear justified choice for English text. Well structured.												
Level 2 (5–8)	Explains both methods with some comparison; a choice is made with partial justification.												
Level 1 (1–4)	Basic points about one or both methods with little comparison or justification.												
0	Nothing creditworthy.												

Total for paper: 34 marks