Question	Part	Marking guidance	Total marks

01		**6 marks for AO3 (program)**
		
		Any fully correct answer should get 6 marks even if it does not map exactly to the following mark points.
		
		Maximum 5 marks if the answer contains any errors.
		
		Mark A: using a selection statement in the nested `WHILE` loop;
		Mark B: using a Boolean condition that tests for equality//inequality of the `image1` and `image2` variables;
		Mark C: indexing either `image1` or `image2` using the variables `i` and `j`;
		Mark D: assigning false to inverse within the selection if logically correct throughout the code (if assigned true then check for correctness);
		Mark E: incrementing `j` in the relevant place;
		Mark F: incrementing `i` in the relevant place;
		
		Example 6 mark answer:
		
		`image1 ← [ [0, 0, 0], [0, 1, 1], [1, 1, 0] ]`
		`image2 ← [ [1, 1, 1], [1, 1, 0], [0, 0, 1] ]`
		`inverse ← true`
		`i ← 0`
		`WHILE i ≤ 2`
		`  j ← 0`
		`  WHILE j ≤ 2`
		`  IF image1[i][j] = image2[i][j] THEN (A,B,C)`
		`  inverse ← false (D)`
		`  ENDIF`
		`  j ← j + 1 (E)`
		`  ENDWHILE`
		`  i ← i + 1 (F)`
		`ENDWHILE`
			6

Qu	Part	Marking guidance	Total marks
02	1	**Mark is for AO1 (recall)** (A pixel is a) single point (of colour) in an image/smallest (addressable) part of an image; **A.** Picture element **A.** alternatives to the word point eg dot, element	1
02	2	**Mark is for AO2 (apply)** 64 // 2^6;	1
02	3	**3 marks for AO2 (apply)** 500/500kB/500 kilobytes;;; If incorrect answer is given then award a maximum of 2 marks for working as follows: indicating the colour depth is 5; multiplying (800x1000) by the colour depth (even if colour depth is incorrect); correct conversion from bits to kilobytes;	3

Qu	Part	Marking guidance	Total marks
02	4	**3 marks for AO2 (apply)** the `i` column having all values 0-5 in order; the first three rows of the `image` column; the last three rows of the `image` column; **Max 2 marks** if any additional values given.	3

i	image
0	/
1	//
2	//*
3	/
4	/*
5	/*/

Qu	Part	Marking guidance	Total marks
03	1	**Mark is for AO2 (apply)** 01100110;	1

03	2	**2 marks for AO2 (apply)** 256;; If the answer given is not 256 then award a **maximum of one** working out mark for any of the following: • 4 bits per pixel/colour; • 8 * 8 = 64; • Multiplying 64 by any integer; **R.** 4 bits on its own	2

Qu	Part	Marking guidance	Total marks
04		**3 marks for AO2 (apply)** 20;;; Maximum of **two** marks (if not fully correct) from: • multiplying 8 x 10 (even if result is incorrect) // 80 shown in working; • multiplying by 2 // colour depth is 2; • dividing by 8;	3

Qu	Part	Marking guidance	Total marks
05	**1**	**Mark is for AO1 (recall)** Single point in an image; // Smallest (addressable) part / bit of an image // A single dot / point of colour **A.** square for point / dot as long as the context is clear **R.** Picture Element	1

Qu	Part	Marking guidance	Total marks
05	2	**3 marks for AO1 (understanding)** **Maximum of 3 marks**. 1. The pixels are stored consecutively (in memory locations); 2. (With 2 bits) 4 (**A.** 3) combinations of bits are possible // each colour could be represented by a unique 2-bit pattern; 3. the bitmap will need the width and height / dimensions and colour depth / bits per pixel to be stored / included; **A.** metadata would need to be stored **Maximum of 2 marks** for mark points 4–6 4. black pixels could be represented as 00; 5. white pixels could be represented as 01; 6. grey pixels could be represented as 10; **A.** any 2-bit bit pattern for each colour as long as they are distinct from each other **A.** answer that shows Figure 1 with each colour labelled in binary	3

Qu	Part	Marking guidance	Total marks
05	3	**2 marks for AO2 (apply)** 300;; If the answer given is not fully correct then award a **maximum of 1 working mark** as follows: identifying the colour depth as 3; 10 x 10 x their colour depth (even if colour depth incorrect);	2

Qu	Part	Marking guidance	Total marks
05	4	**2 marks for AO2 (apply)** **1 mark** for the left-hand eight bits correct; **1 mark** for the right-hand eight bits correct; 1 1 0 0 0 0 0 0 0 0 0 0 1 1 1 1 If **neither** of the mark points above have been awarded then award a **maximum of 1 working mark** as follows: 1 mark if the first bit is 1 **and** the ninth bit is 0; 1 mark if right-hand seven bits of each byte are correct;	2

Question	Part	Marking guidance	Total marks
06	1	**Mark is for AO2 (apply)** 40 (pixels);	1

Question	Part	Marking guidance	Total marks
06	2	**Mark is for AO2 (apply)** 1/one (bit);	1

Question	Part	Marking guidance	Total marks
06	3	**2 marks for AO2 (apply)** 10;; If the answer given is not fully correct then award **a maximum of 1 working mark** as follows: • Identifying the colour depth as 2; • Multiplying a value by 2; • Multiplying a value by 40; • Dividing the result of a calculation by 8;	2

<table>
<tr><th>Question</th><th>Part</th><th>Marking guidance</th><th>Total marks</th></tr>
<tr><td>06</td><td>4</td><td>Mark is for AO2 (apply)

All rows correct;

<table>
<tr><th>Colour</th><th>Binary representation</th></tr>
<tr><td>White</td><td>00</td></tr>
<tr><td>Black</td><td>01</td></tr>
<tr><td>Grey</td><td>10</td></tr>
</table>
</td><td>1</td></tr>
</table>

Question	Part	Marking guidance	Total marks
06	**5**	**2 marks for AO2 (apply)** **Image C**: (The file size) would increase/double // it would take up more storage space; **I.** any incorrect reference to how much it would increase **Image D**: (The file size) would stay the same // no impact;	2