1. Negative binary values can be represented using either sign and magnitude or two's complement.

    i.   Convert the denary number **-110** to an 8-bit binary number using sign and magnitude.

[1]

    ii.   Convert the denary number **-103** to an 8-bit binary number using sign and magnitude.

[1]

    iii.   Convert the denary number **-98** to an 8-bit binary number using sign and magnitude.

[1]

2.

    i.   Convert the denary number **-54** to an 8-bit binary number using sign and magnitude.

[1]

    ii.   110010101 is a binary number that is represented using sign and magnitude.

    Convert this binary number to a denary number.

[1]

3. Convert the denary number **−21** to an 8-bit number using:

    Sign and magnitude representation.

[1]

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4. Show how the denary number −87 is represented in sign and magnitude binary.

[1]

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5. Show a representation of denary -142 using:

i.   Sign and Magnitude

[2]

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6. Convert the denary number −8 to:

i.   An 8-bit sign and magnitude binary number.

[1]

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7. Convert the denary number -200 to a sign and magnitude representation using the least number of bits.

[2]

END OF QUESTION PAPER

Mark scheme

Question			Answer/Indicative content	Marks	Guidance
1		i	• 1110 1110	1	Correct answer only
		ii	• 1110 0111	1	Correct answer only
		iii	• 1110 0010	1	Correct answer only
2		i	• 1011 0110	1	Correct answer only
		ii	• -149	1	Correct answer only
3			1001 0101	1	Correct answer only
4			1101 0111	1	Correct answer only
5			1100 0111 0	2	Correct answer only
6			1000 1000	1	Correct answer only
7			1110 0100 0	2	Correct answer only
			Total	12	