

2 Numbers are stored in a computer system using binary floating-point representation with:

- 12 bits for the mantissa
- 4 bits for the exponent
- two’s complement form for both the mantissa and the exponent.

(a) Write the normalised floating-point representation of the following positive binary number using this system.

0.00000001110101101

Mantissa	Exponent

[2]

(b) Calculate the normalised binary floating-point representation of –76.1875 in this system. Show your working.

Mantissa	Exponent

Working

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[4]

2 Numbers are stored in a computer using binary floating-point representation with:

- 10 bits for the mantissa
- 6 bits for the exponent
- two's complement form for both the mantissa and the exponent.

(a) Write the normalised floating-point representation of the following binary number using this system.

0.00000011010111

Mantissa

Exponent

[2]

(b) Calculate the normalised binary floating-point representation of −25.3125 in this system. Show your working.

Mantissa

Exponent

Working

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[4]

2 Numbers are stored in a computer using binary floating-point representation with:

- 12 bits for the mantissa
- 4 bits for the exponent
- two’s complement form for both the mantissa and the exponent.

(a) Calculate the normalised binary floating-point representation of +124.4375 in this system.
Show your working.

Mantissa												Exponent			

Working

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[3]

(b) Calculate the denary value of the following normalised binary floating-point number.
Show your working.

Mantissa												Exponent			
1	0	1	0	0	0	1	0	1	0	1	1	0	1	1	0

Working

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Denary value

[3]

- 1 Numbers are stored in a computer using binary floating-point representation with:
- 10 bits for the mantissa
 - 6 bits for the exponent
 - two's complement form for both the mantissa and the exponent.
- (a) Calculate the normalised binary floating-point representation of +201.125 in this system.
- Show your working.

Mantissa

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Exponent

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Working

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[3]

- (b) Calculate the denary value of the given normalised binary floating-point number.
- Show your working.

Mantissa

1	0	1	0	1	1	0	0	1	1
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Exponent

0	0	0	1	0	1
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Working

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Answer

[3]

4 Numbers are stored in a computer using binary floating-point representation with:

- 12 bits for the mantissa
- 4 bits for the exponent
- two’s complement form for both the mantissa and the exponent.

(a) Calculate the denary value of the given normalised binary floating-point number.

Show your working.

Mantissa												Exponent			
0	1	0	0	0	1	1	1	0	1	1	1	0	1	1	1

Working

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Answer [2]

(b) Calculate the normalised binary floating-point representation of −49.1875 in this system.

Show your working.

Mantissa												Exponent			

Working

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[4]