

MrGoff.com Data Rep Test (Offline)

Explain what a rational number is and give an example. (2 marks)

Explain the difference between a kibibyte and a kilobyte and state how many bytes each is. (2 marks)

Multiply the binary numbers 1100 and 11. Show your working. (2 marks)

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Explain what two's complement binary is and state the highest and lowest number that can be represented in whole number two's complement binary using 6 bits. (3 marks)

In two's complement fixed point binary with 4 bits for the whole number part and 4 bits for the decimal part, what is represented by the decimal number 10010110 (1 mark)

What is the value of the binary number 01100101 if it is a floating point number with 5 bits for the mantissa and bits for the exponent, both in two's complement? (3 marks)

Calculate the absolute and relative error of trying to store the number 0.1 as a 5 bit fixed point two's complement number with 1 bit for the whole number part and 4 bits for the decimal part. (2 marks)

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Three numbers below are in two's complement floating point binary with 6 bits for the mantissa and 4 bits for the exponent:

000101 0111

110111 1100

101111 0001

State which of these is normalised and explain how you know. (2 marks)

Explain what even parity is and how it would affect the transmission of the 7 bits 1011001. (2 marks)

A transmission is received using majority voting as 111010000101. How will this be interpreted? (2 marks)

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Explain how a check digit is calculated (5 marks)

State two properties a vector rectangle might have. (2 marks)

Explain whether a company logo should be a bitmap or vector image giving your reasoning. (3 marks)

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Explain how nyquist theorem applies to recording CDs. (3 marks)

Explain how MIDI works. (3 marks)

Explain how the Vernam cipher works. (3 marks)

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The phrase "An eye for a tooth" is stored using the dictionary below. State how many bit will be used to store this compressed phrase and calculate the percentage saving over storing the same phrase in 8-bit ASCII (3 marks)

Entry	Text	Binary
1	An	000
2	_eye	001
3	_for	010
4	_an	011
5	,	100
6	_a	101
7	_tooth	110
