

## Data Representation Quiz

1. Convert to denary:  $01001100_2$   
**76**
2. Convert to binary:  $146_{10}$   
**10010010**
3. Convert to hex:  $93_{10}$   
**5D**
4. Convert to denary:  $1F3_{16}$   
**399**
5. How many bytes in a
  - a. Kibi **1024**
  - b. Mibi  **$2^{20}$**
6. If A = 65, write your name in ASCII
7. Evaluate:  $01001101_2 + 01110110_2$   
 **$11000011_2$**
8. Evaluate  $01010011_2 - 01011111_2$   
 **$11110100_2$**
9. Evaluate  $110_2 \times 101_2$   
 **$11110_2$**
10. Convert to fixed point binary 13.625  
 **$1101.101_2$**
11. Length of sound clip = 10 seconds, bits per sample = 8 sample rate = 8000. What is the size of the file in kilobytes  
**80**
12. Width of image = 12 pixels, height of image = 8 pixels, no of colours = 8. What is the size of the image in bytes:  
**36**

13. List 3 pieces of metadata for an image  
width, height, file type, resolution
14. Explain majority voting.  
Each bit is sent three times. If a bit is corrupted, the majority bits of the same value are taken to be the correct value.
15. Explain how sound is converted from analogue to digital.  
Sound is converted to electrical analogue signal by microphone. The analogue signal is sampled at regular intervals and then quantised, before being stored as binary data
16. Explain what MIDI is.  
MIDI is sound protocol that allows communication between different musical devices. The sound that is comprised of messages (eg note on, note off, volume, pitch) that allows for easy editing.
17. If the Caesar cypher key is B, decipher the following cyphertext: CBOBOBT  
Bananas
18. For even parity what bit would we add to 010001?  
0
19. What are the advantages of vector graphics compared with bitmap graphics.  
Easy to edit, generally smaller in size requiring less storage, scalable
20. Why do we compress data?  
To make files smaller to save space, and take up less bandwidth when transmitting data
21. Apply RLE to the following sequence 011000111100010  
1:0,2:1,3:0,4:1,3:0,1:1,1:0
22. Why might RLE compression actually increase the size of a file.  
Because you have to store both the value and the length of the run, so for a dataset with few consecutive pixels with the same value, the file can end up being larger.