



20 Exam-Style Questions

Data Representation Edition

This exam practice pack by **FutureLogic Education** contains 20 exam-style Data Representation questions designed for IGCSE Computer Science revision.

Questions

1. Define the term binary. (2 marks)
2. State how many bits are in one byte. (1 mark)
3. Convert 45 into binary. (3 marks)
4. Convert 10110110 into denary. (3 marks)
5. Explain why hexadecimal is used instead of binary. (3 marks)
6. State what is meant by overflow. (2 marks)
7. Describe how two's complement is calculated. (3 marks)
8. Define metadata. (2 marks)
9. State two examples of image metadata. (2 marks)
10. Explain the difference between resolution and colour depth. (4 marks)
11. Describe how lossy compression reduces file size. (3 marks)
12. State one advantage of lossless compression. (1 mark)





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| 13. Explain what Run Length Encoding (RLE) does. | (3 marks) |
| 14. Define sampling in sound representation. | (2 marks) |
| 15. Explain what is meant by sample rate. | (2 marks) |
| 16. Explain what is meant by sample resolution. | (2 marks) |
| 17. Describe two factors affecting image file size. | (4 marks) |
| 18. Describe two factors affecting sound file size. | (4 marks) |
| 19. Explain one advantage and one disadvantage of high resolution images. | (4 marks) |
| 20. Explain why sound with a higher sample rate usually has better quality. | (3 marks) |

Answers on the next page →





Answers

1. A number system using only the digits 0 and 1 to represent data.
2. 8 bits.
3. 00101101
4. 182
5. Hexadecimal is shorter and easier for humans to read, write, and convert than long binary strings.
6. Overflow occurs when the result of a calculation is too large to be stored in the available number of bits.
7. Invert all bits (change 0s to 1s and 1s to 0s), then add 1 to the result.
8. Data that describes other data — for example, information stored about a file.
9. Date and time taken; camera type / model; GPS location.
10. Resolution is the number of pixels in an image — more pixels means more detail. Colour depth is the number of bits used per pixel — more bits means more possible colours.
11. Lossy compression permanently removes some data (e.g. fine detail the human eye may not notice) to reduce the file size. The data cannot be recovered.
12. No data is permanently lost — the original file can be fully restored.





13. RLE identifies sequences of repeated values and stores them as a single value plus a count, rather than repeating each value individually. This reduces file size.

14. Sampling is the process of measuring the amplitude of a sound wave at regular time intervals and storing each measurement as a binary value.

15. Sample rate is the number of samples taken per second, measured in Hertz (Hz). A higher sample rate captures the sound wave more accurately.

16. Sample resolution (bit depth) is the number of bits used to store each sample. A higher bit depth allows more precise amplitude values to be recorded.

17. Resolution — more pixels means a larger file. Colour depth — more bits per pixel means more colour information to store, increasing file size.

18. Sample rate — more samples per second produces a larger file. Sample resolution — more bits per sample means more data stored, increasing file size.

19. Advantage: higher resolution produces a sharper, more detailed image with better visual quality. Disadvantage: higher resolution significantly increases the file size, requiring more storage space and longer transfer times.

20. A higher sample rate takes more measurements of the sound wave per second. This captures rapid changes in amplitude more accurately, producing a more faithful reproduction of the original sound.

