**Assessment test**

1. a. State how many

i. bits there are in a byte [1]

ii. bytes there are in a kilobyte [1]

iii. bytes there are in a megabyte [1]

b. A DVD can hold about 4.5 Gigabytes. Which unit of measurement would be most appropriate for the following storage media: [2]

|  |  |
| --- | --- |
| DVD | Gigabyte |
| CD-ROM |  |
| Hard Disk |  |

1. A computer stores instructions and values in binary form.
2. Explain why computer use binary. [2]
3. Calculate the denary value of the 8-bit number 01101001. Show your working. [1]
4. Convert the binary number 01001110 to denary. Show your working. [1]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use the segment of the ASCII code below in this question.

* 1. Convert the following binary data into text characters: [1]

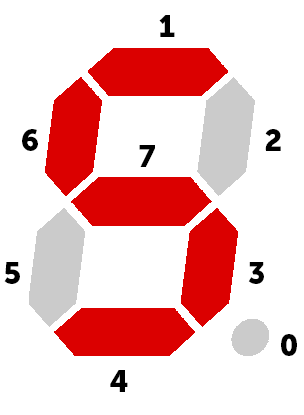
01000110 01000001 01000011 01000101

|  |  |
| --- | --- |
| Binary | Character |
| 01000001 | A |
| 01000010 | B |
| 01000011 | C |
| 01000100 | D |
| 01000101 | E |
| 01000110 | F |

* 1. How many bytes would the following message require: [1]

**Bring hat!**

1. A car park has a digital display sign indicating the number of spaces available. It has a total capacity of 350 cars requiring a three-digit display. Each digit is represented by an 8-bit register corresponding to each segment in the digit displayed.



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | **1** | **0** | **1** | **1** | **0** | **1** | **0** |

The register contents above, would display the digit 5.

What would be the contents of each register to display 239 spaces remaining. [3]

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **2** |  |  |  |  |  |  |  |  |
| **3** |  |  |  |  |  |  |  |  |
| **9** |  |  |  |  |  |  |  |  |

1. Photo editing packages often use colour codes in hexadecimal and denary rather than binary.
2. Convert the hexadecimal colour code 3C into binary. Show your working. [2]
3. Convert the denary colour code 42 into hexadecimal. Show your working. [2]
4. Explain why colour codes are given in hexadecimal rather than binary. [2]

1. Give one alternative use for hexadecimal numbers in computing. [1]

e. A monochrome icon image imported into the photo editing package has a resolution of 72 pixels per inch.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

i. What is meant by resolution? [1]

ii. What would the file size in bytes be for the icon image? Show your working. [1]

iii The image artist would like to add two colours to the icon. Explain how this would affect the file size. [2]

1. Sanjay is recording his voice for a presentation and can adjust the recording resolution and sampling frequency on his computer.
2. Explain the effect of increasing these settings on the quality and size of the sound file [4]

b. Sanjay needs to make sure his recording can be sent by email. Suggest a suitable file format for the file and briefly explain why this is suitable. [3]

7. (a) Explain the difference between lossy and lossless compression. [4]

(b) A list of file extensions for common file standards used on the Internet is shown below.

**DOCX PDF JPG MP4 GIF MP3 ZIP**

Complete the table below to show which format from the list given above should be used for each of the following files which are to be uploaded to the Internet. [4]

|  |  |
| --- | --- |
| **File** | **File format** |
| A compressed file of all the GCSE results for a school, sent by the Exam Board. |  |
| A high resolution photograph to be used as a background image on a web page |  |
| An audio recording downloaded from the Internet |  |
| A video uploaded to YouTube |  |

[Total 40 marks]