MODULE C DATA REPRESENTATION · C9

Representing images

Original practice questions · 20 marks · ~25 minutes · Cambridge 0478 syllabus 1.2.3

Name _____ Date _____

Instructions. Answer all questions in the spaces provided. No calculator. The marks for each part are shown in brackets [ ]. The total for this worksheet is **20 marks**.

1

Total: 3 marks

A museum takes digital images of its exhibits and stores them as bitmap images.

(a) State what is meant by a **pixel**. **[1]**

(b) State what is meant by the **resolution** of an image. **[1]**

(c) State what is meant by the **colour depth** of an image. **[1]**

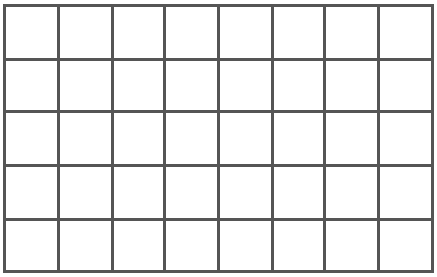
2

Total: 4 marks

(a) The museum's exit sign is a black-and-white bitmap image, 8 pixels wide and 5 pixels high. Each pixel is stored as 1 bit: 1 is black and 0 is white. The binary for each row is: **[2]**

Row 1: **`00011000`**
Row 2: **`00001100`**
Row 3: **`11111110`**
Row 4: **`00001100`**
Row 5: **`00011000`**

Shade the grid to show the image.



(b) The museum wants the sign to use 16 different colours. State the colour depth needed. **[1]**

(c) State how many different colours can be represented with a colour depth of 8 bits. **[1]**

3

Total: 4 marks

(a) Complete the table. The first row has been done for you. **[4]**

Colour depth (bits)	Number of different colours
1	2
3	
5	
	128
10	

4

Total: 1 mark

(a) An image uses 100 different colours. State the **minimum** colour depth needed. **[1]**

5 Total: 3 marks

(a) Tick (✓) **one** box in each row to show whether each statement is true or false. **[3]**

Statement	True	False
The file size of an image increases as its resolution increases		
Increasing the colour depth increases the number of pixels in an image		
An image with a higher colour depth can show more different colours		

6 Total: 5 marks

The museum scans a painting to display on its website.

(a) Explain the effect of **increasing the resolution** of the scan. **[2]**

(b) The museum reduces the colour depth of the scans from 24 bits to 8 bits so they load faster on its website. Explain the effects of this change. **[3]**

Total for this worksheet: 20 marks