MODULE C DATA REPRESENTATION · C1

Why computers use binary

Original practice questions · 20 marks · ~25 minutes · OCR J277 spec 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) State the **two** digits used in binary. **[1]**

(b) State the name given to a single binary digit. **[1]**

(c) Tick (✓) **one** box to show what a processor is built from. **[1]**

Component	Tick (✓) one
Billions of tiny switches (transistors)	
A small number of large dials	
Billions of tiny light bulbs	
Magnetic tape	

2

Total: 4 marks

(a) Tick (✓) **one** box in each row to show whether each statement is true or false. **[4]**

Statement	True	False
Each switch in a processor can be in one of three states		
The instructions in a program are stored in binary		
Images are stored as pictures, so they do not need converting to binary		
A switch that is on can be represented by 1		

3 **Total: 4 marks**

A delivery firm fits a smart doorbell at each of its depots. The doorbell has a camera, a microphone and a small screen that shows text messages to drivers.

(a) Identify **two** different types of data the doorbell must convert into binary before it can process them. **[2]**

1

2

(b) A driver speaks into the microphone. Describe what must happen to the sound before the doorbell's processor can process it, and why. **[2]**

4 **Total: 4 marks**

Each extra switch doubles the number of different on/off patterns that a group of switches can make.

(a) Complete the table to show how many different patterns each group of switches can make. **[3]**

Number of switches	Number of different patterns
1	2
2	.....
3	.....
8	.....

(b) State the name given to a group of 8 bits. **[1]**

5 **Total: 2 marks**

(a) Explain why a computer must convert data into binary format before it can process it. **[2]**

6 **Total: 3 marks**

An IT technician writes this in a training guide: *"Computers use binary because binary is the only thing they understand."*

(a) Explain why this statement does not fully explain why computers use binary, and give a better explanation. **[3]**

Total for this worksheet: 20 marks