MODULE C DATA REPRESENTATION · C2

Converting denary and binary

Original practice questions · 20 marks · ~25 minutes · OCR J277 spec 1.2.4

Name _____ Date _____

Instructions. Answer all questions in the spaces provided. No calculator. All binary numbers are positive whole numbers of up to 8 bits. The marks for each part are shown in brackets [ ]. The total for this worksheet is **20 marks**.

1

Total: 2 marks

(a) State the place value of the most significant bit (MSB) in an 8-bit binary number. **[1]**

(b) State the largest denary number that can be stored in 8 bits. **[1]**

2

Total: 3 marks

(a) Convert the binary number **00101101** into denary. **[1]**

(b) Convert the binary number **11010010** into denary. **[1]**

(c) Convert the 4-bit binary number **1011** into denary. **[1]**

3 Total: 5 marks

(a) Convert the denary number **77** into an 8-bit binary number. Show your working. **[2]**

Answer: .....

(b) Convert the denary number **200** into an 8-bit binary number. Show your working. **[2]**

Answer: .....

(c) Convert the denary number **6** into an 8-bit binary number. **[1]**

Answer: .....

4 Total: 4 marks

A greenhouse controller stores settings, such as fan speed and window opening, as 8-bit binary numbers.

(a) Complete the table by filling in each empty box. **[4]**

Setting	Denary	8-bit binary
Fan speed		01100100
Window opening	170	
Light level		11111110
Water timer	33	

5 Total: 3 marks

A technician converts the denary number 156 into 8-bit binary and writes **00111001**.

(a) Explain the mistake the technician has made and give the correct 8-bit binary number for 156. **[3]**

Correct binary: .....

6 **Total: 3 marks**

(a) A sensor stores each reading using 5 bits. State the largest denary number the sensor can store. **[1]**

(b) Explain why the denary number 300 cannot be stored as an 8-bit binary number. **[2]**

Total for this worksheet: 20 marks