MODULE C DATA REPRESENTATION · C2

Converting denary and binary

Original practice questions · 20 marks · ~25 minutes · Cambridge 0478 syllabus 1.1.2

Name _____ Date _____

Instructions. Answer all questions in the spaces provided. No calculator. All numbers are positive integers; binary numbers are up to 16 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 base of the binary number system. **[1]**

(b) State the base of the denary number system. **[1]**

2

Total: 3 marks

(a) Convert the 8-bit binary number **01110011** to denary. **[1]**

(b) Convert the 16-bit binary number **0000010110010110** to denary. Show your working. **[2]**

Answer: .....

3 **Total: 5 marks**

(a) Convert the denary number **181** to 8-bit binary. **[1]**

Answer: .....

(b) Convert the denary number **1000** to 16-bit binary. Show your working. **[2]**

Answer: .....

(c) Convert the denary number **40000** to 16-bit binary. Show your working. **[2]**

Answer: .....

4 **Total: 4 marks**

A warehouse robot stores values in binary registers. Some registers are 8-bit and some are 16-bit.

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

Value	Register size	Denary	Binary
Shelf number	8-bit	52	
Parcel count	8-bit		10000001
Distance travelled	16-bit	5000	
Item code	16-bit		1000100000000001

5 **Total: 3 marks**

An engineer converts the denary number 13 to 8-bit binary and writes **10110000**.

(a) Explain the error the engineer has made and give the correct 8-bit binary number. **[3]**

Correct binary: .....

6 **Total: 3 marks**

(a) Give the largest denary number that can be stored in a 16-bit register. **[1]**

(b) Explain why the denary number 70000 cannot be stored in a 16-bit register. **[2]**

Total for this worksheet: 20 marks