MODULE C DATA REPRESENTATION · C6

Binary shifts

Original practice questions · 19 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 8 bits. The marks for each part are shown in brackets [ ]. The total for this worksheet is **19 marks**.

1

Total: 3 marks

(a) State the effect on a number of a binary shift of **one** place to the **left**. **[1]**

(b) State the effect on a number of a binary shift of **two** places to the **right**. **[1]**

(c) State the binary digit that fills the gaps made by a binary shift. **[1]**

2

Total: 3 marks

(a) Give the 8-bit result of carrying out a binary shift of **two** places to the **left** on the binary number **00011010**. **[1]**

	128	64	32	16	8	4	2	1
Result								

(b) Give the 8-bit result of carrying out a binary shift of **three** places to the **right** on the binary number **01110000**. **[1]**

	128	64	32	16	8	4	2	1
Result								

(c) Convert your answer to part (b) into denary. **[1]**

Answer (denary): .....

3 **Total: 4 marks**

An adult-education centre's heating controller stores the room temperature reading as an 8-bit binary number. The reading is 01011001.

(a) Give the 8-bit result of a binary shift of **one** place to the **right** on 01011001. **[1]**

Answer (binary): .....

(b) Convert your result from part (a) into denary. **[1]**

Answer (denary): .....

(c) 01011001 is 89 in denary, and 89 ÷ 2 = 44.5. Explain why the shifted result is **not** 44.5. **[2]**

4 **Total: 4 marks**

(a) The number 00000111 is shifted to give 00111000. Identify the binary shift that was applied. **[2]**

Direction: .....

Number of places: .....

(b) The number 10100000 is shifted to give 00001010. Identify the binary shift that was applied. **[2]**

Direction: .....

Number of places: .....

5 **Total: 2 marks**

(a) A program needs to multiply a binary number by 16. Describe the binary shift that would do this. **[2]**

6 **Total: 1 mark**

(a) Tick (✓) **one** box to show the result of a binary shift of **two** places to the **right** on 00110100. **[1]**

Result	Tick (✓) one
11010000	
00001101	
00011010	
00001110	

7 **Total: 2 marks**

(a) Explain why a binary shift of one place to the left doubles a number (as long as no 1s are shifted off the end). **[2]**

Total for this worksheet: 19 marks