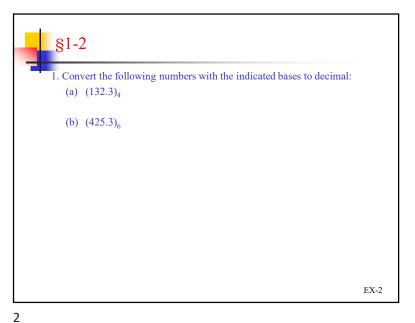


 $\begin{array}{c}
\textbf{§1-2} \\
\textbf{2. In each of the following cases, determine the radix } r: \\
\textbf{(a) } (24)_r = (18)_{10} \\
\textbf{(b) } (231)_r = (91)_{10}
\end{array}$ EX-3



3. Perform the following binary arithmetic operations:
(a) i. 1011 + 0110 ii. 110 × 011

(b) i. 1011001 + 1011010 ii. 01101 × 11011



§1-3 & 1-4

- 4. Convert the following numbers from the given base to the other three bases listed in the table.
 - (a)

Decimal	Binary	Octal	Hexadecimal
19.5	?	?	?
?	?	63.75	?

(b)

Decimal	Binary	Octal	Hexadecimal
237.875	?	?	?
?	?	156.375	?

EX-5

5



§1-5

- 6. (a)
- i. Perform the indicated subtraction with the following unsigned binary numbers by 1's complement addition:

11101 - 10001

00101 - 10100

ii. Perform the indicated subtraction with the following unsigned binary numbers by ${\bf 2}$'s complement addition:

11101 - 10001

00101 - 10100

- (b) Repeat (a) for
 - i. 10110101 01001101, 01001101 10110101
 - ii. 10110101 01001101, 01001101 10110101

EX-7



§1-:

- 5. Obtain the 1's and 2's complements of the following 8-bit binary numbers:
 - (a) 1000110, 11011010
 - (b) 01010011, 10011000

EX-6

6



§1-6

7. (a) The following binary numbers have a sign in the leftmost position and, if negative, are in 2's complement form. Perform the indicated arithmetic operations and indicate if *overflow* occurs for each computation. (Hint: Perform subtraction by 2's complement addition.)

i. 001011 + 100110

ii. 110001 - 010010

(b) Repeat (a) for

i. 10110101 – 01001101

ii. 01001101 + 10110101

EX-8



- 8. (a) Represent the decimal numbers 25 and 87 in BCD, and then show the steps necessary to form their sum.
 - (b) Represent the decimal numbers 376 and 843 in BCD, and then show the steps necessary to form their sum.

EX-9

9



Brief Answers of the Exercises (2/2)

- 5. (a) i. 10111001, 10111010 ii. 00100101, 00100110
 - (b) i. 10101100, 10101101 ii. 01100111, 01101000
- 6. (a) i. 01100, -01111 ii. 01100, -01111
 - (b) i. 01101000, -01101000 ii. 01101000, -01101000
- 7. (a) i. 110001 ii. Overflow (b) i. overflow ii. 00000010
- 8. (a) 000100010010 _{BCD}
 - (b) 0001001000011001_{BCD}

EX-11



Brief Answers of the Exercises (1/2)

```
1. (a) 30.75
```

(b) 161.5

2. (a) 7

(b) 6

3. (a) i. 10001 ii. 10010

(b) i. 10110011 ii. 101011111

4. (a) $(19.5)_{10} = (10011.1)_2 = (23.4)_8 = (13.8)_{16}$ $(63.75)_8 = (51.953125)_{10} = (110011.111101)_2 = (33.\text{F4})_{16}$

(b) $(237.875)_{10} = (11101101.111)_2 = (355.7)_8 = (ED.E)_{16}$ $(156.375)_8 = (110.494140625)_{10} = (1101110.011111101)_2 = (6E.7E8)_{16}$

EX-10

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