INTERNATIONAL UNIVERSITY OF SARAJEVO

CS303 Digital Design
Active Tutorial 1
8/10/2019

1. Convert the following numbers with the indicated bases to decimal:
   a) $(4310)_5$
   b) $(435)_8$
   c) $(198)_{12}$
   d) $(345)_6$

2. Convert the decimal number 431 to binary in two ways:
   a) Directly to binary
   b) Convert first to hexadecimal and then from hexadecimal to binary.

3. Express the following numbers in decimal:
   a) $(10110.0101)_2$
   b) $(16.5)_{16}$
   c) $(26.24)_8$
   d) $(DADA.B)_{16}$

4. Add and multiply the following numbers without converting them to decimal.
   a) Binary numbers 1011 and 101.
   b) Hexadecimal numbers 2E and 34.

5. Do the following conversion problems:
   a) Convert decimal 27.315 to binary
   b) Calculate the binary equivalent of 2/3 out to eight places. Then convert from binary to decimal. How close is the result to 2/3?
   c) Convert the binary result in (b) to hexadecimal. Then convert the result to decimal. Compare the results.

6. Obtain 1's and 2's complements if the following binary numbers:
   a) 11011010
   b) 10101010

7. Find 9's and 10's complement of the following decimal numbers:
   a) 25 478 036
   b) 63 325 600

8. Perform subtraction on the given unsigned binary numbers using 2's complement of the subtrahend. When the result should be negative, find its 2's complement and affix a minus sign.
   a) 10011 – 10010
   b) 1001 – 101000
   c) 1001 - 110101

9. Represent the decimal number 5137 in:
   a) BCD
   b) Excess- 3 code
   c) 2421 code
   d) 6311 code

10. Determine the base of the numbers in each case for the following operations to be correct:
    a) 14/2 = 5 b) 54/4 = 13 c) 24 + 17 = 40.

11. Convert the hexadecimal number 68BE to binary, and then convert it from binary to octal.

12. Convert the following binary numbers into signed and unsigned decimal values:
    a) $110110_{(2)}$ b) $101000_{(2)}$

13. Convert the following signed decimal numbers into binary:
    a) $-12_{(10)}$ b) $-7_{(10)}$