Department of Computer Science and Engineering

Khulna University of Engineering & Technology

1st Year 1st Term, Session: 2014-2015

Assignment on CSE-1100

1. Why do you study the binary number system? Explain in brief (200-300 words).
2. What is the range of a binary number of 64 bits? If the number is signed or unsigned?
3. What number do you get when you attach a zero at the right end of a binary number (such as 10100_2). What number do you get when you attach 2 zeros at the right end? In general, what number do you get when you attach *n* zeros at the right end? Explain your answer.
4. The decimal expansion of 11/16 is 0.6875. Find the binary expansion of the fraction 11/16. Do not stop until you are certain you know the EXACT expansion.
5. Find the base k, if $(543)_6 = (317)_k$. k is a positive integer.
6. If $(19257)_{10}$ is written as $(110100)_k$. Find the value of k. k is a positive integer.
7. Convert the following hexadecimal numbers to decimal.

   71_8 , 71_{16}, $DE0_{16}$, 11011_8, ABC_{16}, 1001_{16} , 70.7_8, $A1.F_{16}$
8. Convert the following binary numbers to decimal.
   110011.1101_2, 1100111101_2, 110111.11101_2 and 110111_2.
9. Convert the following octal numbers to decimal.
   123.23_8, 23456.236_8, 756734_8 and 34243.753_8
10. Convert the following numbers with the indicated base to decimal number.
    12121_3, 12343_5, 15435_6, 198_{12}, 345678_9 and 123_4
11. Convert the following decimal numbers to the indicated base.
    1. 7684.245 to octal.
    2. 45682.783 to hexadecimal.
    3. 2345.126 to binary.

12. Evaluate the followings
    a) 101 + 11
    b) 111 + 111
    c) 1010 + 1010
    d) 11101 + 1010
    e) 11111 + 11111
    f) 10 - 10
    g) 101 - 11
    h) 1001 - 11
    i) 1101 - 11
    j) 10001 - 100
    k) 10 x 10
    l) 100 x 11
    m) 101 x 10
    n) 1011 x 11
    o) 11011 x 101
    p) 100 / 10
    q) 111 / 11
    r) 1010 / 100
    s) 1101 / 11

    10111 / 10

    (i) 110.11 + 10.011
    (ii) 1010.01 + 1101.11
    (iii)1111.110 – 1010.001
    (iv) 1101.11-101.01
    (v) 1011 – 10.01
    (vi) 100-11.1
    (vii) 11.11 – 10.10
    (viii) 0.1101 – 0.1001

13. Evaluate the followings (hexadecimal numbers)
    $(B\ A\ 3)_{16} + (5\ D\ E)_{16}$
    1A + 2E
    BEAD – 4321
    BEAD + 4321
    10000 - 1
14. Find 1's and 2's complement
    (a) 11001 (b) 0.1100111 (c) 0011001 (d) 10100.11001
15. Encode the following decimal numbers in BCD code:
    (a) 45 (b) 273.98 (c) 62.905
16. Write down the decimal numbers represented by the following BCD codes:
    (a) 100101001 (b) 100010010011 (c) 01110001001.10010010
17. Encode the following decimal numbers to Excess-3 code:
    (a) 38 (b) 471.78 (c) 23.105
18. Express the following Excess-3 codes as decimal numbers:
    (a) 0101 1011 1100 0111 (b) 0011 1000 1010 0100 (c) 0101 1001 0011
19. Encode the following decimal numbers to Gray codes:
    (a) 61 (b) 83 (c) 324 (d) 456
20. Express the following binary numbers as Gray codes:
    (a) 10110 (b) 0110111 (c) 101010011
    (d) 101011100 (e) 110110001 (f) 10001110110