Assignment 1

1. Convert the following decimal number to equivalent binary numbers:
   (a) $(652.2350)_{10}$
   (b) $(6.25563)_{10}$
   [**for infinite fractional part, just do 4-5 steps**]

2. Convert the following base number to equivalent base 5 numbers:
   (a) $(45012)_7$
   (b) $(764.248)_9$
   (a) $(012012)_3$
   (b) $(35.12304)_6$

3. Convert the following binary numbers to equivalent hexadecimal numbers:
   (a) $(10101.01010100)_2$
   (b) $(11010001.1110101111)_2$
   (a) $(101111101011)_2$

4. Convert the following binary numbers to equivalent octal numbers:
   (q) $(101010101010101)_2$
   (b) $(1101011101.11101010101111)_2$
   (b) $(11111.111010111)_2$

5. Perform the following base conversions
   (a) $(48A)_{13} = (?)_6$
   (b) $(10110111)_7 = (?)_4$
   (c) $(0011)_{BCD} = (?)_4$
   (d) $(10011)_{10} = (?)_{Excess3}$
   (e) $(110\ 0011)_{10} = (?)_{Excess7}$

6. Perform **addition**, **subtraction** and **multiplication** for the pair of following base-7 numbers. Verify your results by converting the problem into decimal.
   645
   566

7. Perform **addition**, **subtraction** and **multiplication** for the pair of following base-9 numbers. Verify your results by converting the problem into decimal.
   623
   178

8.
   (a) $(0100101011111)_{2s} = (?)_{10}$
   (b) $(1010101000011)_{2s} = (?)_{10}$
   (c) $(010010101111)_{1s} = (?)_{10}$
   (d) $(111010101001010011)_{1s} = (?)_{10}$

9. Subtract 13 from 22 in 7 bits using 2's complement number system and justify whether there is an overflow or not.

10. Subtract 45 from 98 in 12 bits using 2's complement number system and justify whether there is an overflow or not.

11. Add 19 with 47 in 8 bits using 2's complement number system and justify whether there is an overflow or not.

12. Perform the following arithmetic operations using 13-bit two's complement and one's complement systems and justify if there is an overflow in each case.
    a) 91- 499
    b) 379 + 98