Tutorial – 1

1. Compute the value of 'b' for the following case:

   $(16)_b = (100)_b$

2. Determine the base value of the number system in which the following expressions will hold:

   (a) 23 + 44 + 14 + 32 = 223

   (b) $\frac{41}{3} = 13$

   (c) $\sqrt{41} = 5$

3. Find the diminished radix complement for the following:

   (a) $(135)_8$ and $(135)_{16}$

   (b) $(671)_{16}$ and $(ACD)_{16}$

4. Calculate the radix complement of the following:

   (a) $(135)_8$ and $(135)_{16}$

   (b) $(671)_{16}$ and $(ACD)_{16}$

5. Compute the (a) signed magnitude, (b) 1's Complement and (c) 2's Complement for the following:

   (i) 11011

   (ii) 0101

   (iii) 1111111

   (iv) 1111

6. Subtract $(3250)_{10}$ from $(72532)_{10}$ using 10's complement.

7. (a) A person in Saturn possessing 18 fingers has a property worth $(100000)_{18}$. He has 3 daughters and 2 sons. He wants to distribute half the money equally to his sons and the remaining half to his daughters equally. How much will each son and daughter get in Indian Currency?

(b) An Indian started an expedition to Saturn with Rs. 100,000. The expenditure on Saturn will be in the ratio of 1:2:7 for food, clothing and travelling. How much will he be spending on each item in the currency of Saturn.

8. Express -73.75 in 12-bit 2's Complement form.

9. Determine the following:

   (a) 9's complement of $(782.54)_{10}$ and $(5473.924)_{10}$.

   (b) 15's complement of $(ACD.\ 35)_{16}$.

   (c) 7's complement of $(670.13)_8$.