# GLA University-Mathura

## Department of Computer Engineering and Applications Computer Organization- B. Tech-II

# Tutorial Sheet -I

### What do mean by computer Architecture and Computer Organization?

1. What is Von Neumann Computer System?
2. Convert the Following Numbers into Binary i. (4310)5

ii. (198)10

iii. (246)8

1. Convert the following into decimal i. (10110.0101)2

ii. (BABA)16

iii. (26.24)8

### Determine the base of the number for the following operation i. 14/2 =5

ii. 24 +17 = 40

1. The solution of the quadratic equation x2-11x+22=0 are x=3 & x=6. What is the base/radix of the number?
2. Add these number without converting them into Decimal
   1. Binary numbers 1011 and 101
   2. Hexadecimal numbers 2E and 34
3. Convert Hexadecimal Number 68BE to binary and then binary to octal. [ Answer (26814)10 = (64276)8 = (0110 1000 1011 1110)2
4. Complete the Following

|  |  |  |  |
| --- | --- | --- | --- |
| **Decimal** | **Binary** | **Octal** | **Hexadecimal** |
| 33 |  |  |  |
|  | 1101011.11 |  |  |
|  |  | 3.07 |  |
|  |  |  | C82 |

1. Convert:

a. (10110.0101)2 ( ) 10

b. (16.5)16 (?) 10

c. (26.24)16 (?) 10

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**Tutorial Sheet -II**

1. The 2’s complement representation of -6 is 1010 in 4-bit register. What will be its 2’s complement representation in 8-bit register?
2. What is the smallest negative integer represented in 8-bit register? [ -128]
3. Convert decimal +46 and +29 to binary using 2’s complement representation and enough digits to accommodate the numbers. Then perform the binary equivalent of

#### i. (+29) + (-46)

**ii. (-29) + (+46)**

**iii. (-29) + (-46)**

1. Represent decimal number in “-13” in all three methods of negative binary number representation using 8-bit register.
2. Add the following numbers: i. (ABC)16 + (CDE)16

ii. (77)8 + (107)8

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**Tutorial Sheet -III**

**Complements**

1. 2’s Complement of a 2’s complement is .
2. Which number representation has two representation of **“0”** .
3. **Obtain the 1’s and 2’s complement of the following**: i. 1000 0000

ii. 0101 0101

iii. 0000 0000

#### Find the 9’s and 10’s complement of the following:

i. 1234 5678

ii. 6332 5600

iii. 0000 0000

1. Find the 16’s complement of the “**BABA**”

#### Perform the following subtraction using 2’s complement method:

i. 01000 – 01001

ii. 100101- 010111

#### Perform the following subtraction using signed 10’s complement

i. 6428-3409

ii. 2043-6152

#### Perform the following

* 1. Convert the decimal number 225.225 into binary numbers
  2. Perform the (-42) - (-13) using 2’s complement method.

1. What is an overflow and underflow condition? Which Gate is used to verify the Overflow condition?

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## Department of Computer Engineering and Applications

**Tutorial Sheet – IV**

### Represent the number (+46.5), as a floating-point binary number with 24 bits. The normalized fraction mantissa has 16 bits and the exponent has 8 bits.

Solution: **[46.5 = 32+8+4+2+0.5 = (101110.1)2] = 0.1011101 x 26**

|  |  |  |  |
| --- | --- | --- | --- |
| **0** | **1011101 0000000** | **0** | **0000110** |
| 1-Sign bit | 15 bit Mantissa | 1-Sign bit  Exponent | 7 bit Exponent |
| 16 bit Mantissa | | 8 bit Exponent | |

### Represent the following in IEEE-754 Floating Point Representation (In Single Precision) i. (23.25)10

ii. (101111.10101)2

iii. (0.00001101111)2

iv. (0.375)10

1. What is the condition of overflow while adding two binary numbers? How this condition is detected? Perform the arithmetic operation (+70) + (+80) and (-70) + (-80) with binary numbers in signed 2’s complement representation and show how the condition of overflow occurred in both the cases.
2. Represent the given number in IEEE standard 32-bit format, 1.00010100 X 2-10.
3. Represent -307.187510 in single and double precision formats
4. Show the value of all bits of a 12-bit register that hold the number equivalent to decimal 215 in:
   1. Binary ii) Binary coded octal iii) Binary coded hexadecimal no. iv) BCD
5. Perform the subtraction with the following unsigned no. by taking 2’s complement for binary and 10’s complement for decimal no. of the subtrahend.

i) 11010 – 10000 ii) 100 – 110000 iii) 1010100 – 1010100 iv) 1753 – 8640 v) 1200 – 250