

# A.D.Patel Institute of Technology

## ECE Department

### 2131004: Digital Electronics

#### Assignment /Question Bank

#### Unit-1

#### Binary Systems and Logic Circuits

1. State the advantages of digital circuits over analog circuits.
2. State the advantages of binary system.
3. Write following decimal digital in base-3.  
(i) 10    (ii) 21    (iii) 45    (iv) 78    (v) 101
4. Add and Multiply the following numbers in the given base without converting to decimal.  
(i)  $(1230)_4$  and  $(23)_4$     **Ans: 1313, 102210**  
(ii)  $(135.4)_6$  and  $(43.2)_6$     **Ans: 223, 11314.52**  
(iii)  $(367)_8$  and  $(715)_8$     **Ans: 1304, 336313**  
(iv)  $(296)_{12}$  and  $(57)_{12}$     **Ans: 331, 13706**
5. Convert the decimal number 250.5 to base-4, base -7 .  
**Ans: 3322.2, 505.333.....**
6. Convert the following number from binary to decimal.  
(i) 10.10001    (ii) 101110.0101  
**Ans: 2.53125 , 46.3125**
6. Convert the following number from given base to the base indicated.  
(i)  $(225.225)_{10} = ( )_2 = ( )_8 = ( )_{16}$   
**Ans: 11100001.001110011 , 341.16314, E1.399**  
(ii)  $(11010111.110)_2 = ( )_{10} = ( )_8 = ( )_{16}$   
**Ans: 215.75 , 327.6, D7.C**  
(iii)  $(623.77)_8 = ( )_{10} = ( )_2 = ( )_{16}$   
**Ans: 403.9843, 110010011.111111 , 193.FC**  
(iv)  $(2AC5.D)_{16} = ( )_{10} = ( )_8 = ( )_2$   
**Ans: 10949.8125 , 25305.64, 10101011000101.1101**
7. Convert the following numbers to decimal.  
(i)  $(1001001.011)_2$     (ii)  $(12121)_3$     (iii)  $(1032.2)_4$     (iv)  $(198)_{12}$   
**Ans: 73.375, 151, 78.5, 260**
8. Obtain 1's and 2's complement of following binary numbers.  
(i) 1010101    **Ans: 1's comp: 0101010, 2's comp: 0101011**

- (ii) 0111000    **Ans: 1's comp: 1000111, 2's comp: 1001000**
- (iii) 0000001    **Ans: 1's comp: 1111110, 2's comp: 1111111**
- (iv) 10000    **Ans: 1's comp: 01111, 2's comp: 10000**
- (v) 00000    **Ans: 1's comp: 11111, 2's comp: 00000**

**9.** Obtain 9's and 10's complement of following decimal numbers.

- (i) 13579    **Ans: 9's comp: 86420 , 10's comp: 86421**
- (ii) 09900    **Ans: 9's comp: 90099 , 10's comp: 90100**
- (iii) 90090    **Ans: 9's comp: 09909 , 10's comp: 09910**
- (iv) 10000    **Ans: 9's comp: 89999 , 10's comp: 90000**
- (v) 00000    **Ans: 9's comp: 99999 , 10's comp: 00000**

**10.** Find the 10's complement of  $(935)_{11}$ .

**Ans:  $(175)_{11}$**

**11.** Perform the subtraction using 9's complement.

- (i) 5250 - 321    (ii) 3570-2100    (iii) 753-864    (iv) 20-1000

**12.** Perform the subtraction using 10's complement.

- (i) 5250 - 321    (ii) 3570-2100    (iii) 753-864    (iv) 20-1000

**13.** Perform the subtraction using 1's complement.

- (i) 11010 - 1101    (ii) 11010 - 10000    (iii) 10010 - 10011    (iv) 100 - 110000

**14.** List out various types of binary codes and explain in brief.

**15.** Represent the decimal number 8620 in (a) BCD    (b) Excess-3    (c) in 2 4 2 1 code and (d) in binary code.

**Ans: (a) 1000 0110 0010 0000**

**(b) 1011 1001 0101 0011**

**(c) 1110 1100 0010 0000**

**(d) 1000011 0101100**

**16.** Briefly explain positive and Negative Logic in binary system.

**17.** List out various logic families and explain in brief.

**18.** Draw and prepare truth table of various logic gates.