



## XII Std. Open Book Test-1&2: Number Systems, Logic Gates

Max. Marks: 20

**Ques 1:** Fill in the blanks: (1+1+1+1+1=5)

- 1) The unique decimal equivalent of binary number 11010111 is given as \_\_\_\_\_.
- 2) The hexadecimal number 1AD7 is \_\_\_\_\_.
- 3) When both inputs of an Ex-OR gate are equal to logic-1 then its output will be \_\_\_\_\_.
- 4) Subtract 10111 from 110000 and select the correct option \_\_\_\_\_.
- 5) The 2's complement of 101001 is given as \_\_\_\_\_.

**Options: (215, 240, 317) (3829, 6871, 6812) (0, 1, none of these) (10111, 11101, 11001) (010111, 101101, 10101)**

**Ques 2:** How NAND gate is used as universal building block? Draw the necessary circuit diagrams and truth tables and write the derivation of each output equation. (1+1+1=3)

**Ques 3:** Explain the working of 4-bit binary adder using half and full adder circuits. Draw the necessary block diagram and explain the working by taking any one input combination. (1+3=4)

**Ques 4:** Draw correct logic diagrams for the given logic equations:  $Y = ABC\bar{C} + A\bar{B}C + \bar{C}\bar{D}$  and  $Y = A\bar{B} + \bar{A}B$  (2+2=4)

**Ques 5:** Define and prove De Morgan's both theorems. (1½+1½=3)