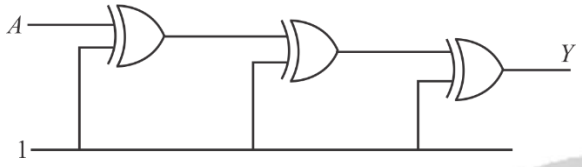
Branch : CS & IT

Subject : Digital Electronics

DPP-3

Topic : XOR Gate, XNOR Gate

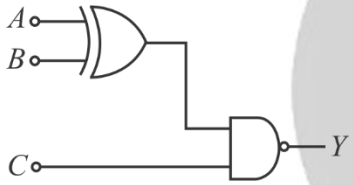
1. The initial output of the following circuit is 1. If we apply 010101 at input *A* (first bit is zero), then what is the bit pattern generated at the output *Y*.



(a) 010101 (b) 101010

(c) remains at 0 (d) remains at '1'

2. The Boolean expression of the output of the logic circuit shown in figure is



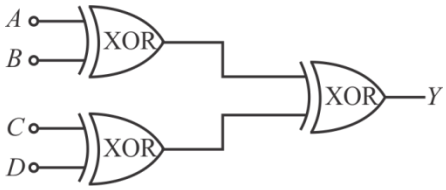
(a) $Y = \bar{A}\bar{B} + AB + \bar{C}$

(b) $Y = \bar{A}\bar{B} + AB + C$

(c) $Y = \bar{A}B + \bar{A}B + C$

(d) $Y = \bar{A}B + \bar{A}\bar{B} + C$

3. *A*, *B*, *C* and *D* are input, and *Y* is the output bit in the XOR gate circuit of the figure below. Which of the following statements about the sum *S* of *A*, *B*, *C*, *D* and *Y* is correct?



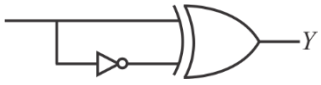
(a) *S* is always either zero or odd.

(b) *S* is always either zero or even.

(c) *S* = 1 only if the sum of *A*, *B*, *C* and *D* is even.

(d) *S* = 1 only if the sum of *A*, *B*, *C* and *D* is odd.

4. The output *Y* of the logic circuit given below is



(a) 1 (b) 0

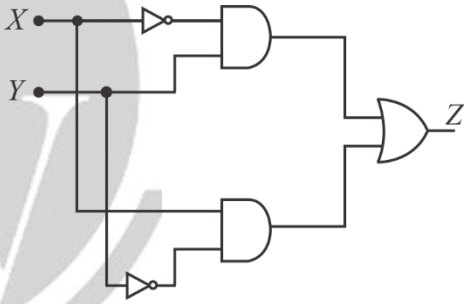
(c) x (d) $\bar{x}$

5. A bulb in a staircase has two switches, one switch being at the ground floor and the other one at the first floor. The bulb can be turned ON and also can be turned OFF by any one of the switches irrespective of the state of the other switch. The logic of switching of the bulb resembles

(a) an AND gate (b) an OR gate

(c) an XOR gate (c) a NAND gate

6. In the circuit shown below, *X* and *Y* are digital inputs, and *Z* is a digital output. The equivalent circuit is



(a) XNOR gate (b) NOR gate

(c) NAND gate (d) XOR gate

7. Which one of the following gate is also known as equivalence gate?

(a) EX-OR (b) AND

(c) EX-NOR (d) NOR

8. The logic function $f = \overline{xy + \bar{x}\,\bar{y}}$ is equal to

(a) EX-NOR (b) NAND

(c) EX-OR (d) NOR

9. The minimum number of 2 input NOR gates required to implement a 2 input XOR gate is_____

10. The minimum number of 2 input NAND gates required to implement a 2 input EX-NOR gates is

(a) 4 (b) 5

(c) 3 (d) 6

Answer Key

1. **(b)**
2. **(a)**
3. **(b)**
4. **(a)**
5. **(c)**
6. **(d)**
7. **(c)**
8. **(c)**
9. **(5)**
10. **(b)**