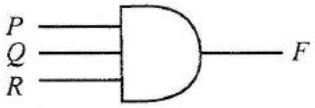
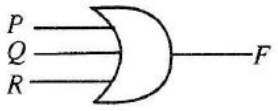
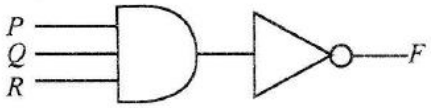
Grade 10 | Logic Gates with Boolean Function | MCQ Paper

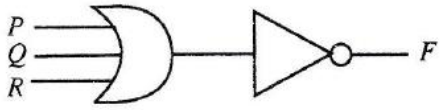
1. Consider a logic circuit with three inputs P, Q, R and one output F. The following is observed in this circuit: (2015)
   - If any single input is 1, then output F is 0, irrespective of what the remaining inputs are.
   - If all inputs are 0, then the output F is 1.

   Which of the following is the most likely logic gate configuration for the circuit?

(1) 

(2) 

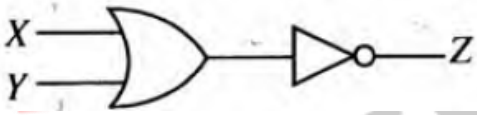
(3) 

(4) 

2. To qualify in an examination, candidates have to pass one compulsory subject S_1 and one of the three optional subjects S_2, S_3 and S_4. Which of the following Boolean expressions correctly represents this scenario? (2015)

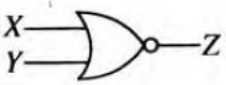
   1) S_1 AND (S_2 AND S_3 AND S_4)
   2) S_1 AND (S_2 OR S_3 OR S_4)
   3) S_1 OR (S_2 AND S_3 AND S_4)
   4) S_1 OR (S_2 OR S_3 OR S_4)

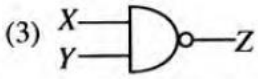
3. Consider the following logic circuit diagram. (2016)

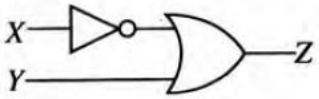


Which of the following is equivalcnt to the above logic circuit?

(1) 

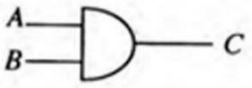
(2) 

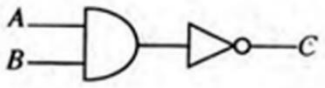
(3) 

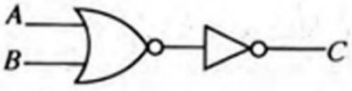
(4) 

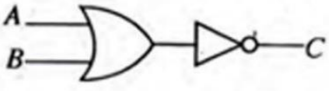
4. Which of the following logic circuits represents the given truth table? (2016)

A	B	C
0	0	1
0	1	1
1	0	1
1	1	0

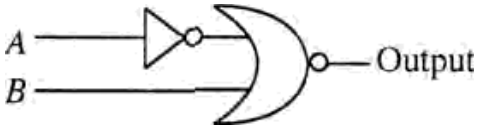
(1) 

(2) 

(3) 

(4) 

5. Which of the following truth tables is equivalent to the logic circuit given below? (2017)



A	B	Output
0	0	1
0	1	1
1	0	1
1	1	0

(1)

A	B	Output
0	0	0
0	1	0
1	0	1
1	1	0

(2)

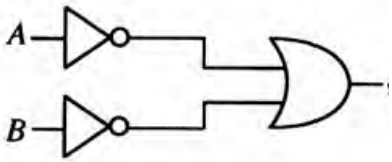
A	B	Output
0	0	0
0	1	1
1	0	0
1	1	0

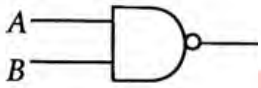
(3)

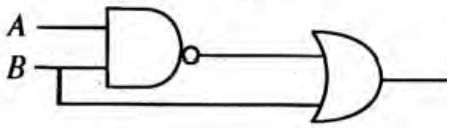
A	B	Output
0	0	0
0	1	1
1	0	1
1	1	0

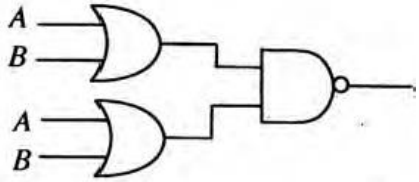
(4)

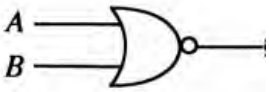
6. Which of the following logic circuits has a truth table equivalent to the truth table of the logic circuit shown on the right hand side? (2017)



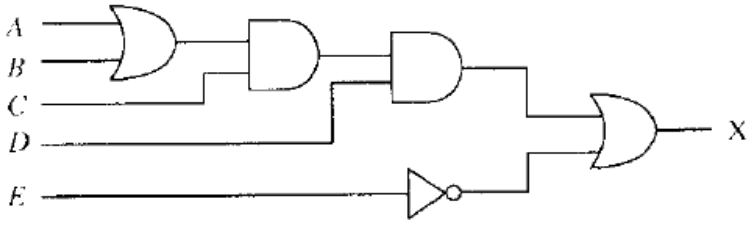
(1)


(2)


(3)


(4)


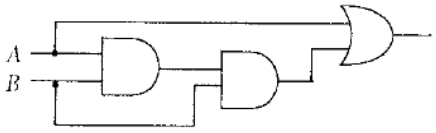
7. Consider the following logic circuit. (2018)



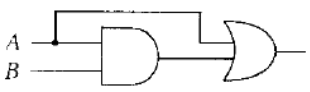
Which of the following is equivalent to the above circuit?

1) $X = (A + B) .C. (D + \bar{E})$
2) $X = (A + B) .C. D + \bar{E}$
3) $X = (A . B) + C + D . \bar{E}$
4) $X = (A + B) . (C + D) + E$

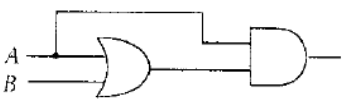
8. For given inputs, which of the following logic circuits provide the same output? (2018)



I



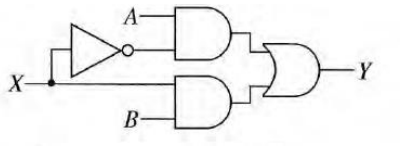
II



III

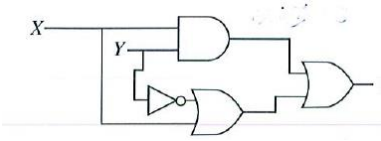
1) I and II only
2) I and III only
3) II and III only
4) All I, II and III

9. If 0 and 1 respectively are given as inputs for X in the following logic circuit, what would be the two respective outputs at Y? (2019)



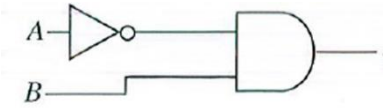
1) A, $\overline{B}$
2) A, B
3) B, $\overline{A}$
4) B, A

10. Which of the following Boolean expression is equivalent to the output of the given logic circuit? (2020)

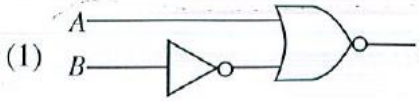


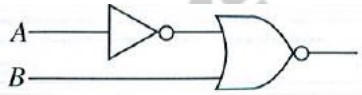
1) (X . Y) + ($\overline{Y}$ + X)
2) (X + Y) . ($\overline{Y}$. X)
3) (X + Y) . (X . $\overline{Y}$)
4) (X . Y) + (Y + $\overline{X}$)

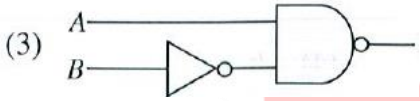
11. Consider the following logic circuit: (2020)



Which of the following logic circuits has a truth table equivalent to the above logic circuit?

(1)


(2)


(3)


(4)