Duration: 30 Min   **Max Marks: 20**

1. **A+AB** gets simplified to _____

2. Find the equivalent of A+(~A)+(~B)

3. Convert the following logic gate circuit into a Boolean expression, writing Boolean sub-expressions next to each gate output in the diagram
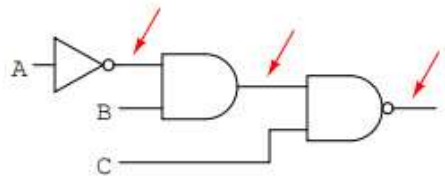
4. Use Boolean algebra to simplify the following expression, then draw a logic gate circuit for the simplified expression: A(B + AB) + AC

5. Implement all logic gates using 2x1 Mux

6. Determine the function performed by the following the circuit. Clear Analysis required.
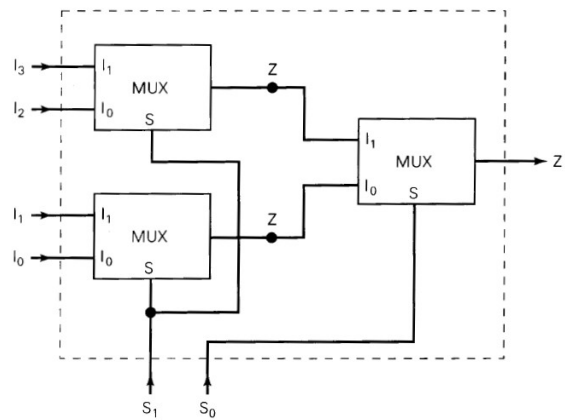
The Boolean expression for the truth table shown is

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

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

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

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

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

7.

8. 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

_____

9. In the 4 × 1 multiplexer, the output F is given by F = A ⊕ B. Find required inputs $I_3I_2I_1I_0$.