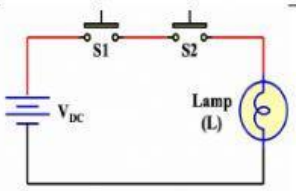
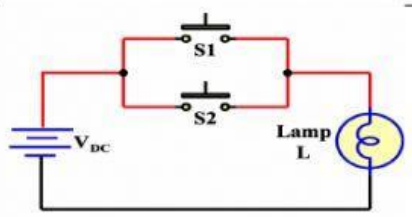
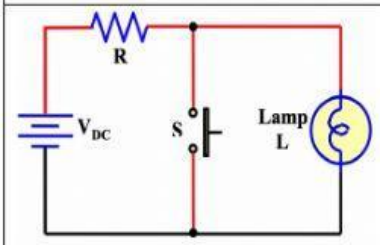
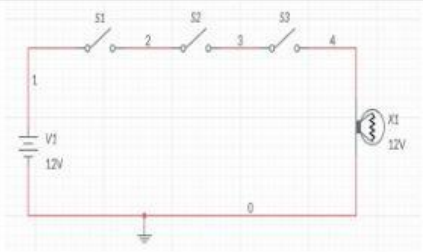
Q1) Study each circuit then complete the truth table next to each one of them.

Note: High = ON = Closed switch = Logic State (1) = 5 V
Low = OFF = Open Switch = Logic State (0) = 0 V

Circuit	Table	Relationship between inputs	Numerical Boolean Function
	**S1** | **S2** | **L** OFF | OFF | OFF | ON | ON | OFF | ON | ON |	Lamp will turn ON if both S1 ….. S2 were ON.	L= S1∗ S2
	**S1** | **S2** | **L** LOW | LOW | LOW | HIGH | HIGH | LOW | HIGH | HIGH |	Lamp will turn ON if at least S1 .. S2 was ON.	L = S1 …S2
	**S** | **L** 0 | 1 |	Lamp will turn …. When the S is OFF.	$L = \bar{S}$
	**S1** | **S2** | **S3** | **L** 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |	Lamp will turn ON when all switches are closed.	L= S1∗ S2*S3

Q2) a. What is the number of input combinations for 4 inputs digital circuit?

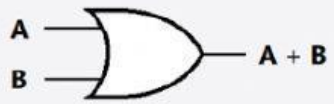
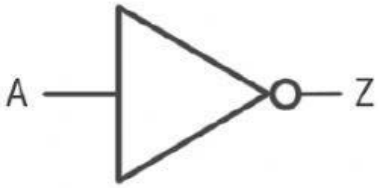
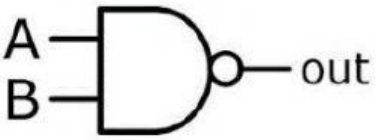
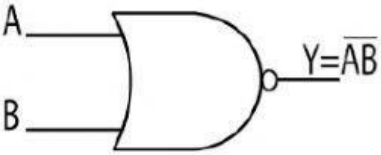
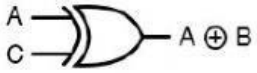
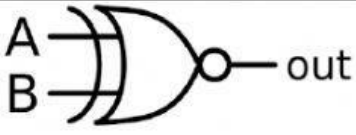
Hint: use the formula 2^N where N is number of inputs.

Number of input combinations = …….. inputs

b. What is the number of input combinations for 5 inputs digital circuit?

Number of input combinations = …….. inputs

Q3) Match the logic gate symbol with its name and Boolean function of the gate output.
Copy the number to its correct place, The first one is done for you.

No.	Gate symbol	Matching number	Gate Name and Boolean function
1			XOR Output= $A \oplus B = A\overline{B} + \overline{A}B$
2			NOR Output= $\overline{A + B}$
3			XNOR Out= $\overline{(A \oplus B)} = (A.B + \overline{A}.\overline{B})$
4		1	OR Output = **A + B**
5			NAND Output = $\overline{A.B}$
6			NOT Output= $\overline{A}$
7			AND Output= **A · B**