

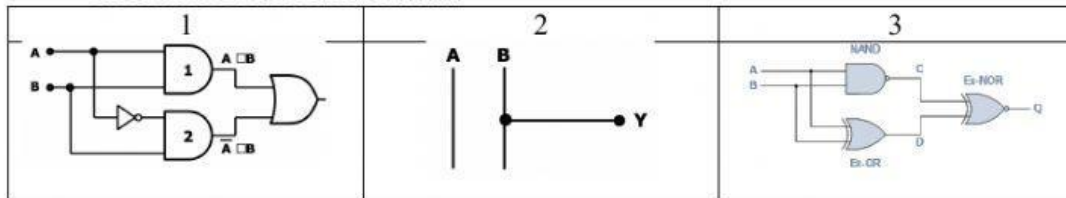
Watch the video in the link [K-Map](#) then answer the questions.

Part 1) a. what is the simplest form for the Boolean expression below? Re-write the expression in the shortest form.

$$Y = \bar{A}B + AB$$

b. What is the simplest circuit for the expression in a?

Insert the circuit number



Part 2) Simplification using K-Map.

a. Draw the truth table for the following Boolean expression.

$$Y = A\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}\bar{B}C$$

A	B	C	Y	Sum of products (SOP)
0			1	$A*B*C*$
0				
0				$A*BC*$
0				
1				$AB*C*$
1			0	
1			0	
1				

b. Watch the video in the link [K-Map](#) then answer the questions.

i) How many variables we have in the expression?

ii) What is the size of the K-Map? 2 or 8 or 16 entries?

c. Complete the correct K-Map template with correct entries from the truth table.

A \ B	0	1
0		
1		

A \ BC	00	01	11	10
0				
1				

AB \ CD	00	01	11	10
00				
01				
11				
10				

d. Mark the SOP groups in the K-map.

e. After using K-Map, what is the simplest form of the expression in a?

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- f. What is the Boolean expression for the following K-Map?

CD \ AB	00	01	11	10
00	0	1	1	0
01	0	1	0	0
11	0	1	0	0
10	1	1	1	1

Y=

Part 3) Application

A bank wants to install an alarm system with movement sensors. The bank have three sensors (A,B,C). To prevent false alarms produced by a single sensor activation, the alarm will be triggered only when at least two sensors activate simultaneously.

Step 1 complete the Truth table

A	B	C	Y

Step 2 Fill in the K- Map with entries from truth table

BC \ A	00	01	11	10
0				
1				

Step 3 Group the SOP terms in the K-Map then find the simplest Boolean expression.

Y=