Apply Boolean algebra rules in the following THREE questions.

QUESTION 25

What is the simplest form of the Boolean function $y' \cdot (x + y)$?

1. $y' \cdot x$
2. $x + y$
3. 1
4. x

QUESTION 26

What is the simplest form of the Boolean function $(x' + y)(y' + z)(x + z')'$?

1. 1
2. $x'z$
3. $x'y' + yz$
4. $x' + y + z'$

QUESTION 27

What is the simplest form of the Boolean function $(x + xy) + xz$?

1. 0
2. x
3. xy
4. $xy + z$

QUESTION 28

Use the following Karnaugh diagram to determine the value of F(x,y,z) using minterms.

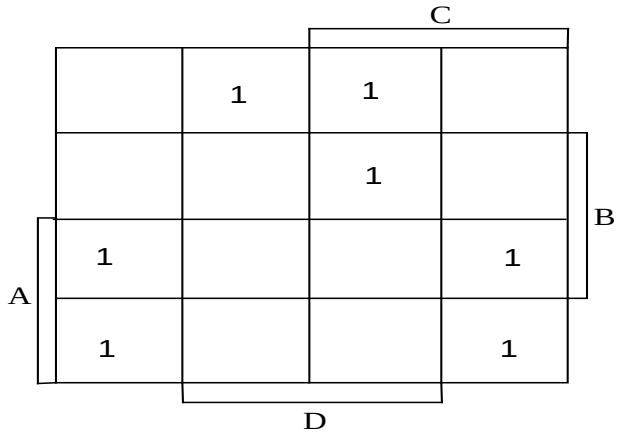
F(x,y,z) = _____?

	y'z'	y'z	yz	yz'
x'		1		1
x	1			1

1. $m_1 + m_2 + m_4 + m_6$
2. $m_1 + m_2 + m_5 + m_7$
3. $m_2 + m_3 + m_4 + m_7$
4. $m_1 + m_3 + m_4 + m_6$

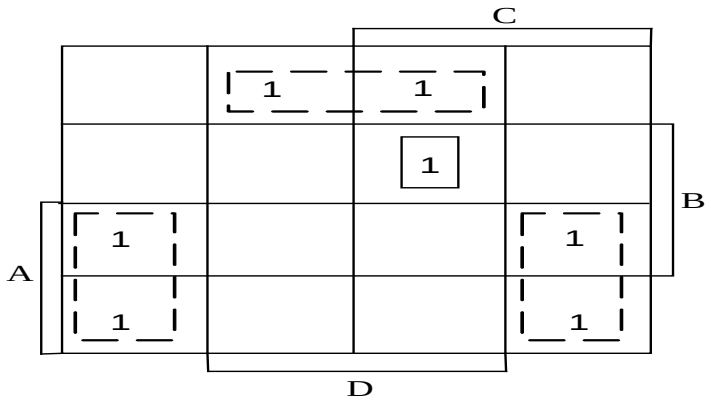
QUESTION 29

Consider the following Karnaugh map:

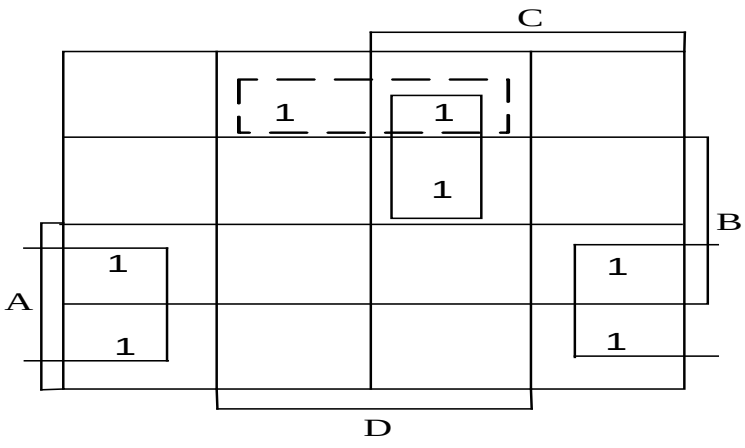


Which one of the following four Karnaugh maps reflects the correct forming of groups?

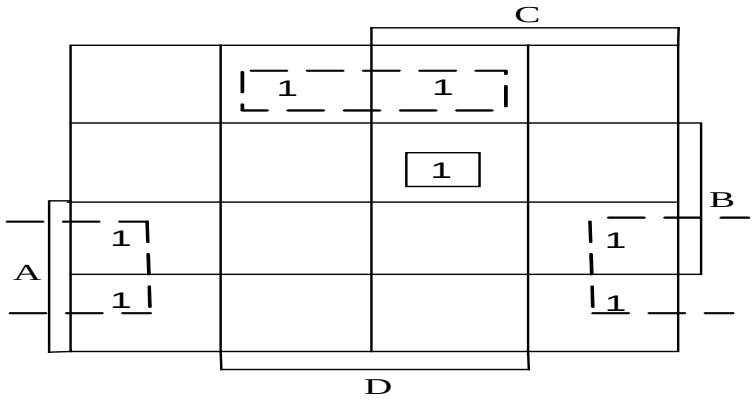
1.



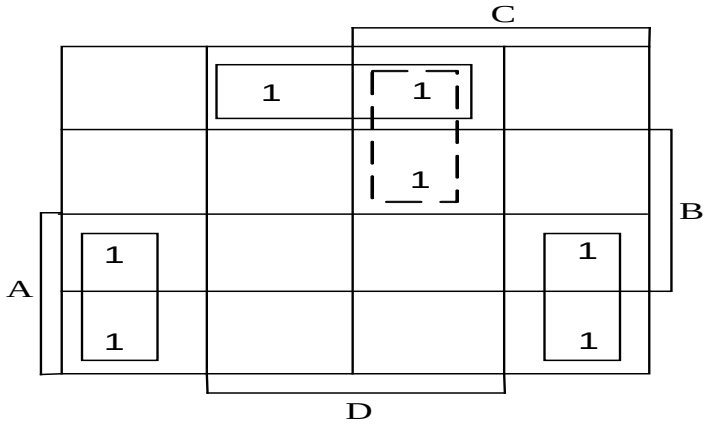
2.



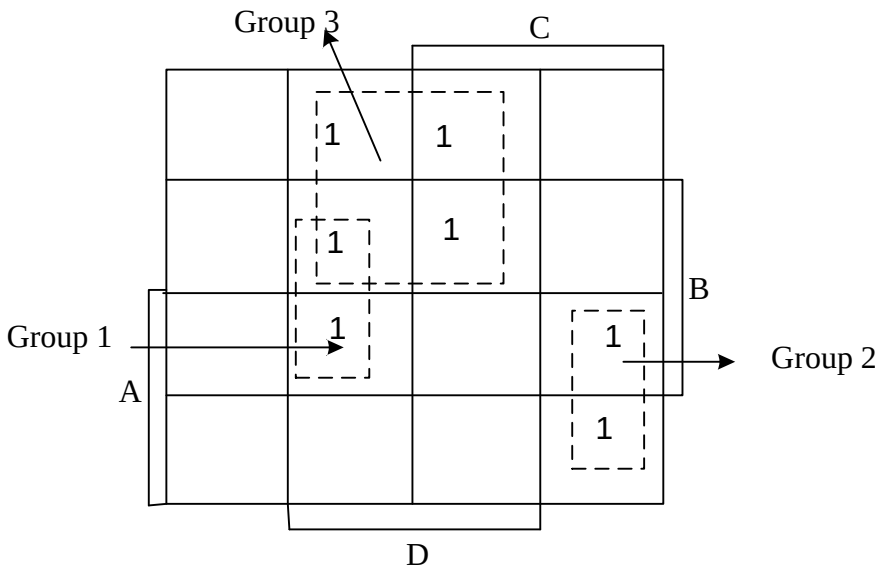
3.



4.



The next THREE questions refer to the Karnaugh map below:



QUESTION 30

Which term represents Group 1?

1. AC′
2. AB′C
3. BCD′
4. BC′D

QUESTION 31

Which term represents Group 2?

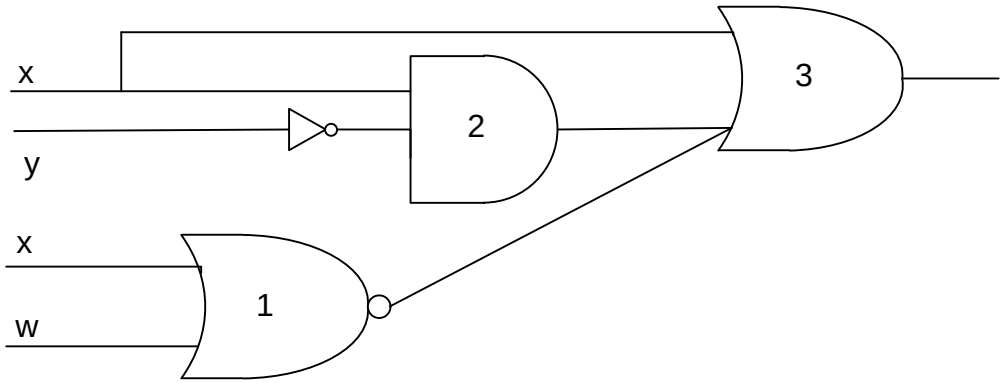
1. AD
2. ACD′
3. BC’D
4. ACD

QUESTION 32

Which term represents Group 3?

1. D
2. A′D
3. ACD′
4. B’C

The next THREE questions refer to the following combinational logic circuit:



QUESTION 33

What is the output of Gate 1?

1. x . w
2. x + w
3. (x + w)′
4. x′ + w′

QUESTION 34

What is the output of Gate 2?

1. x + y
2. x . y′
3. (x + y)′
4. (x . y)′

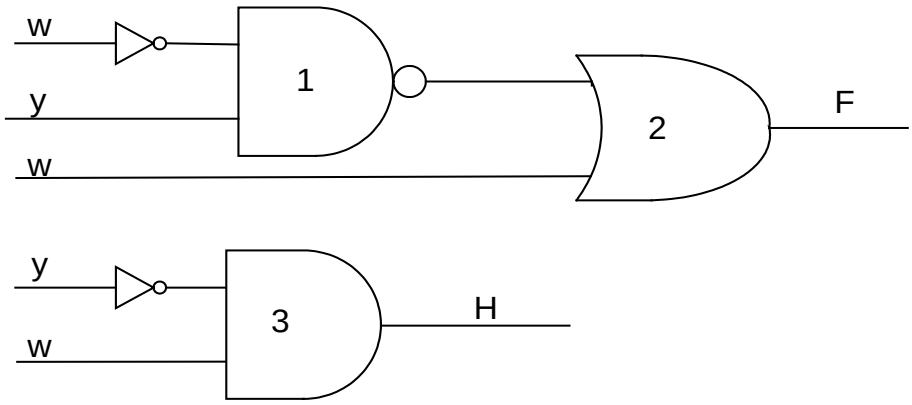
QUESTION 35

What is the output of Gate 3?

1. x + x.y′ + (x+w)′
2. x . w + x.y ′ + x
3. x ′+ w′ + x + y ′
4. x + y′ + z

QUESTION 36

Consider the following two logic circuits:



These two logic circuits are not equivalent. F = (w′y)′ + w and H = y′w. One of the three gates can be changed so that the circuits can become equivalent. Which gate can be changed and what kind of gate must it become?

1. Gate 3 must change to an OR gate.
2. Gate 1 must change to an OR gate.
3. Gate 2 must change to a NAND gate.
4. Gate 3 must change to a NOR gate.

Consider the following scenario:

Three family members, father, mother and daughter, go for the end-of-year holiday at a national park.

The father's phone, **Cell Phone A**, can only access Facebook and LinkedIn. The mother's phone, **Cell Phone B**, can only access LinkedIn and MySpace, and the daughter's phone, **Cell Phone C**, can only access Facebook and Twitter. This means that each phone can access only two social networking sites.

If the father does not forget and takes his Cell Phone A along for the holiday, then variable A = 1 (A = 0 if he forgets it). Likewise variable B = 1 if the mother takes her Cell Phone B along, and variable C = 1 if the daughter takes her Cell Phone C along. Nobody can take another's cell phone. For example, if A = 1, B = 1 and C = 0, it means that the father takes Cell Phone A along (there is access to Facebook and LinkedIn), and the mother takes Cell Phone B along (there is access to LinkedIn and MySpace). In this case the family will have access to only Facebook, LinkedIn and MySpace.

A Boolean function F(A,B,C) is defined as follows: **F(A,B,C) = 1 when the family (Father, Mother and daughter together) have access to <u>at least</u> Facebook, Twitter and LinkedIn** when on holiday**,** otherwise F(A,B,C) = 0.

Different combination inputs for A, B and C are given in the tables in the following FOUR questions. The question that should be answered in each case is: Which alternative shows the correct outputs for F?

QUESTION 37

			Alternative 1	Alternative 2	Alternative 3	Alternative 4
A	**B**	**C**	**F**	**F**	**F**	**F**
0	0	0	0	1	0	1
0	0	1	0	1	1	0

QUESTION 38

			Alternative 1	Alternative 2	Alternative 3	Alternative 4
A	**B**	**C**	**F**	**F**	**F**	**F**
0	1	0	0	1	0	1
0	1	1	1	1	0	0

QUESTION 39

			Alternative 1	Alternative 2	Alternative 3	Alternative 4
A	**B**	**C**	**F**	**F**	**F**	**F**
1	0	0	0	1	1	0
1	0	1	0	1	0	1

QUESTION 40

			Alternative 1	Alternative 2	Alternative 3	Alternative 4
A	**B**	**C**	**F**	**F**	**F**	**F**
1	1	0	0	0	1	1
1	1	1	0	1	1	0