QUESTION 11

Calculate $(1010\ 11)_2 + (101\ 1)_2$

1 $(10001\ 01)_2$
2 $(10000\ 01)_2$
3 $(111101\ 10)_2$
4 $(10001\ 10)_2$

Apply Boolean algebra rules to determine the simplest forms of the given Boolean functions in the following THREE questions:

QUESTION 12

What is the simplest form of the Boolean function $(xy' + 0)'$?

(1) $x' + y$
2 $(xy')' + 0'$
3 1
4 0

$(xy' + 0)'$
$= (\bar{x} + \bar{\bar{y}})$
$= \bar{x} + \bar{\bar{y}}$
$= \bar{x} + y$

QUESTION 13

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

(1) $y'x$
2 $xx + y'x$
3 $x + y'$
4 x

$(x + y')x$
$= x \cdot x + xy'$
$= x + xy'$
$= y'x$

QUESTION 14

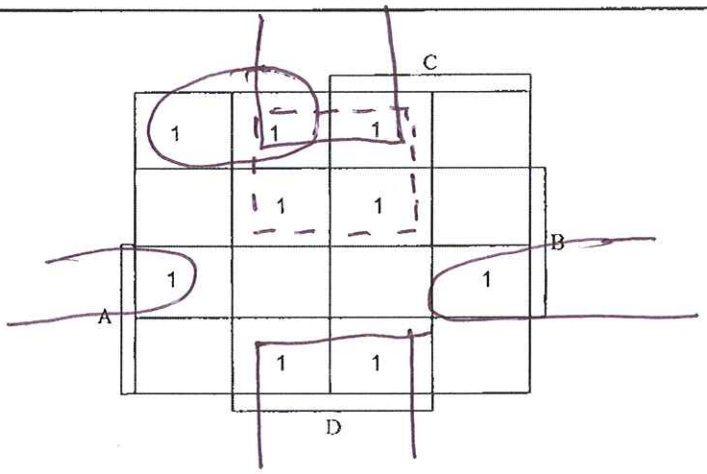
What is the simplest form of the Boolean function $(x+y+z')'$?

1 $x' + y' + z''$
2 $x' + y + z$
3 $x'y'z''$
(4) $x'y'z$

$\overline{(x+y+z')}$
$= \bar{x} \cdot \bar{y} \cdot \bar{\bar{z}}$
$= \bar{x} \cdot \bar{y} \cdot z$

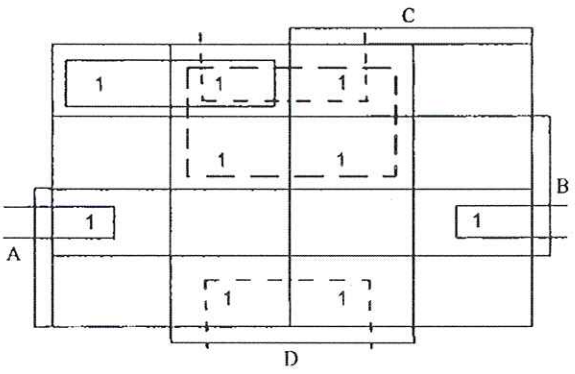
QUESTION 16

Consider the following Karnaugh map

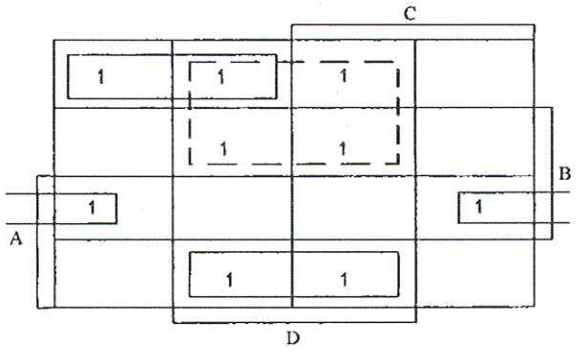


Which one of the following four Karnaugh maps reflects the correct forming of groups?

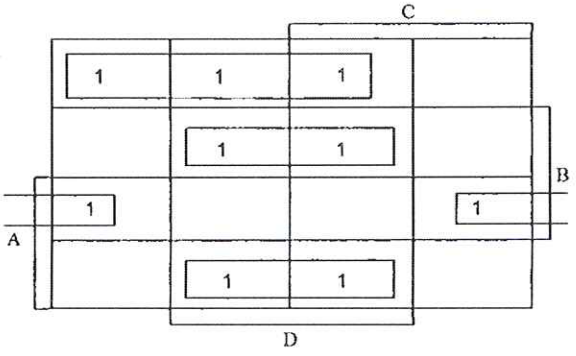
1



2



3



QUESTION 11

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Apply Boolean algebra rules to determine the simplest forms of the given Boolean functions in the following THREE questions:

QUESTION 12

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4 0

QUESTION 13

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

1 $y'x$
2 $xx + y'x$
3 $x + y'$
4 x

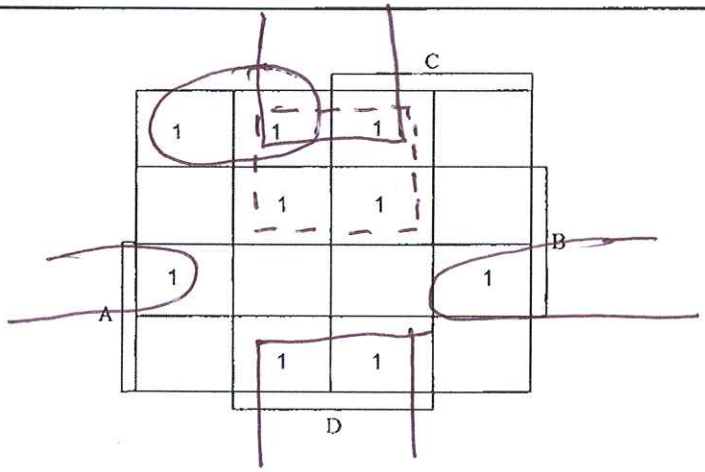
QUESTION 14

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

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

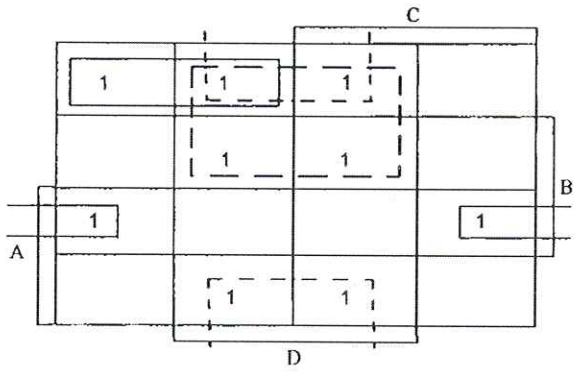
QUESTION 16

Consider the following Karnaugh map

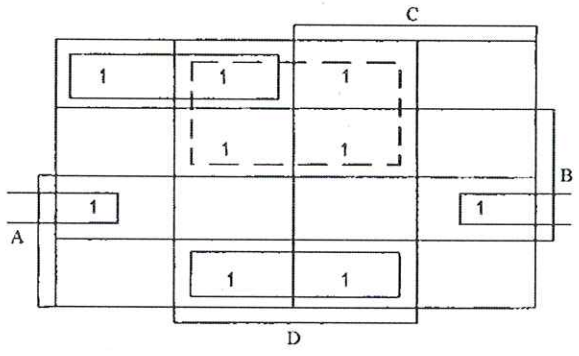


Which one of the following four Karnaugh maps reflects the correct forming of groups?

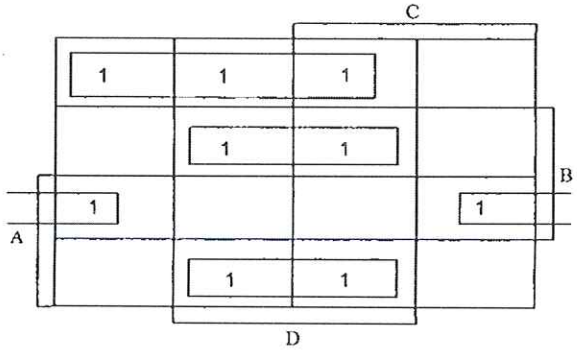
1



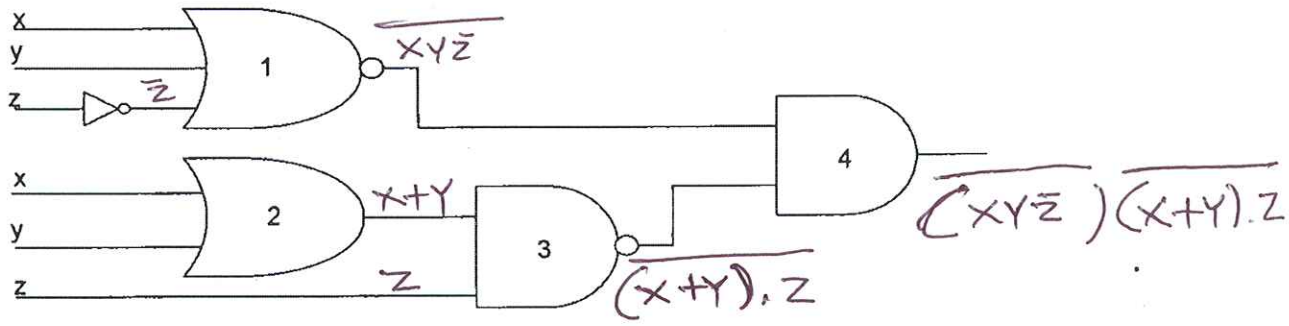
2



3



The following FOUR questions refer to the following combinational logic circuit:



QUESTION 20
What is the output of Gate 1?

1 (x y z')'
2 (x + y + z')'
3 x + y + z'
4 x + y

QUESTION 21
What is the output of Gate 2?

1 x y
2 x + y
3 (x + y) '
4 x y z

QUESTION 22
What is the output of Gate 3?

1 x + y + z
2 ((x y) z) '
3 ((x + y) + z) '
4 ((x + y) z) '

QUESTION 23
What is the output of Gate 4?

1 (x y z')' + ((x + y) + z)'
2 (x y z')' + ((x + y) z)'
3 (x + y + z')' ((x + y) z)'
4 (x y z')' ((x + y) z)'

Rough work

Apply Boolean algebra rules to determine the simplest forms of the given Boolean functions in the following THREE questions.

QUESTION 12

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

1. y'
2. 0
3. $(x + x')y'$
4. 1

Steps:
$(xx' + y)'$
$= (0 + y)'$
$= y'$

QUESTION 13

What is the simplest form of the Boolean function $x + xy'z' + xy'z'$?

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

$x + xy'z' + xyz'$
$x(1 + y'z' + y'z'$
$x(1 + 1)$
$= x$

QUESTION 14

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

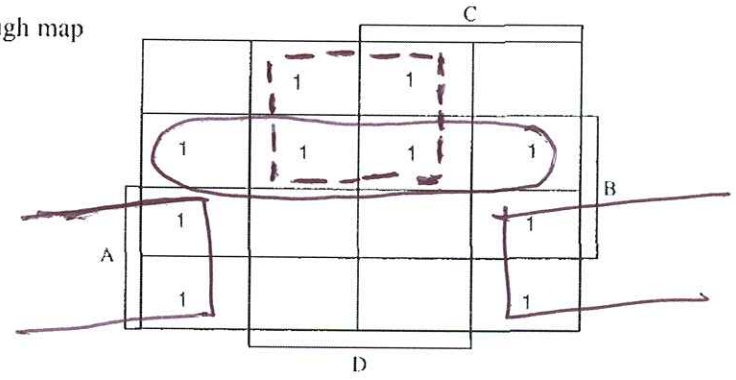
1. $x + y$
2. $xy' + y$
3. 1
4. y

$(x'y') + y$
$= (\overline{x}y) + y$
$= x + \overline{y} + y$
$= x + (\overline{y} + y)$
$= x + y$

Rough work

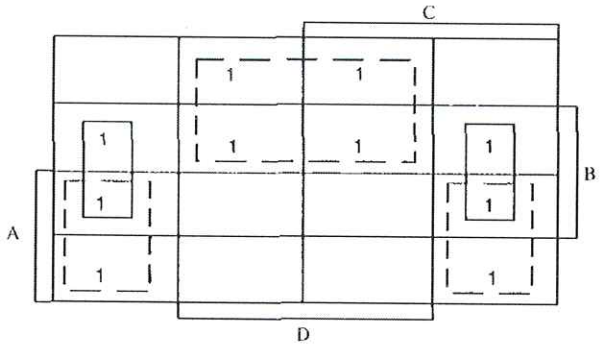
QUESTION 16

Consider the following Karnaugh map

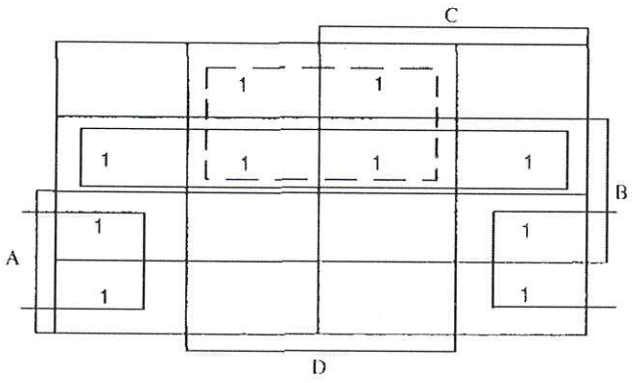


Which one of the following four Karnaugh maps reflects the correct forming of groups?

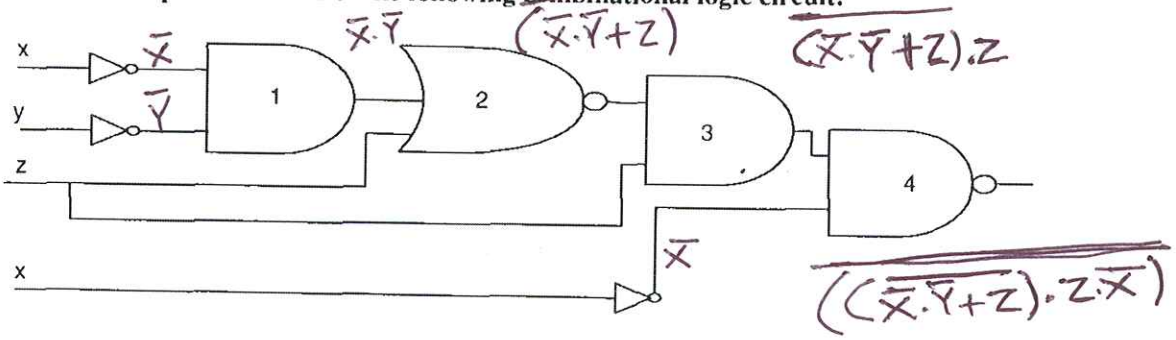
I



2



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



QUESTION 20

What is the output of Gate 1?

1 $(x + y)'$
2 $x'y'$
3 $x' + y'$
4 $(xy)'$

QUESTION 21

What is the output of Gate 2?

1 $[(x + y)' z]'$
2 $(xy)' + z'$
3 $(x'y' + z)'$
4 $[(x' + y') z]'$

QUESTION 22

What is the output of Gate 3?

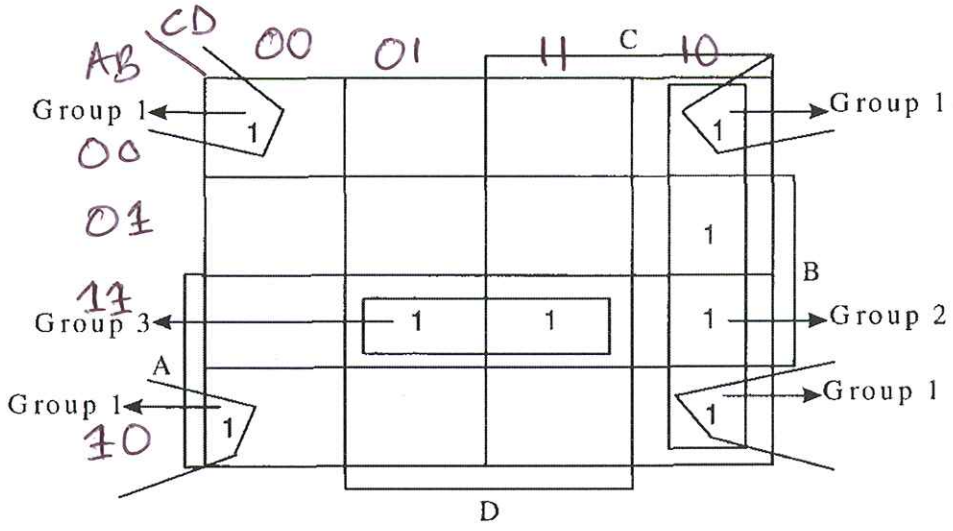
1 $[(x' + y') z]' + z$
2 $[(xy)' + z'] z$
3 $(x'y' + z)' z$
4 $[(x + y)' z]' + z$

QUESTION 23

What is the output of Gate 4?

1 $[(x'y' + z)' z]' x'$
2 $\{(x'y' + z)' z x'\}'$
3 $[[(x' + y') z]' + z + x']'$
4 $[(x + y)' z]' + z + x'$

The next THREE questions refer to the Karnaugh map beneath:



QUESTION 17

Which term represents Group 1?

1 A'B'CD'
2 D'
3 A'
4 B'D'

QUESTION 18

Which term represents Group 2?

1 DC'
2 C'
3 D'
4 CD'

QUESTION 19

Which term represents Group 3?

1 ABD
2 AB
3 D
4 ACD