

**Started on** Friday, 18 February 2022, 2:31 PM

**State** Finished

**Completed on** Friday, 18 February 2022, 3:40 PM

**Time taken** 1 hour 9 mins

**Grade** 41.00 out of 50.00 (82%)

Question **1**

Correct

Mark 2.00 out of 2.00

What is the minimum number of 2-input NOR gates required to implement the function expressed in sum-of-minterms form as

$$f = \Sigma(0, 2, 5, 7, 8, 10, 13, 15)?$$

Assume that all the inputs and their complements are available.

Select one:

- ☐ a. 4
- ☐ b. 5
- ☒ c. 3 ✓
- ☐ d. 2

Your answer is correct.

The correct answer is: 3

Question **2**

Incorrect

Mark 0.00 out of 1.00

How much input and output needed for demultiplexer?

Select one:

- ☒ a. Many outputs to one input ✗
- ☐ b. None of these
- ☐ c. One input one output
- ☐ d. One input many outputs

The correct answer is: One input many outputs

Question **3**

Correct

Mark 1.00 out of 1.00

Let the representation of a number in base 3 be 210. What is the hexadecimal representation?

Select one:

- ☐ a. 528
- ☒ b. 15 ✓
- ☐ c. D2
- ☐ d. 21

The correct answer is: 15

Question 4

Correct

Mark 2.00 out of 2.00

. Mapping the SOP expression  $\bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}BC + AB\bar{C}$ , we get \_\_\_\_\_

		C	
		0	1
AB	00		
	01	1	1
	11		1
	10	1	

(A)

		C	
		0	1
AB	00	1	
	01	1	1
	11	1	
	10		

(B)

		C	
		0	1
AB	00		1
	01		
	11	1	1
	10	1	1

(C)

		C	
		0	1
AB	00	1	1
	01		
	11		1
	10	1	

(D)

Select one:

- ☐ a. A
- ☐ b. D
- ☒ c. B ✓
- ☐ d. C

Your answer is correct.

The correct answer is: B

Question 5

Correct

Mark 1.00 out of 1.00

A digital circuit that can store only one bit is a

Select one:

- ☒ a. Flip-flop ✓
- ☐ b. NOR gate
- ☐ c. Register
- ☐ d. XOR gate

The correct answer is: Flip-flop

Question **6**

Correct

Mark 1.00 out of 1.00

In the toggle mode, a JK flip-flop has

Select one:

- ☐ a.  $J = 0, K = 1$
- ☒ b.  $J = 1, K = 1$  ✓
- ☐ c.  $J = 0, K = 0$
- ☐ d.  $J = 1, K = 0$

The correct answer is:  $J = 1, K = 1$

Question **7**

Correct

Mark 1.00 out of 1.00

The following hexadecimal number (1E.43) Base 16 is equivalent to

Select one:

- ☒ a.  $(36.206)_8$  ✓
- ☐ b.  $(35.506)_8$
- ☐ c.  $(36.506)_8$
- ☐ d.  $(35.206)_8$

The correct answer is:  $(36.206)_8$

Question **8**

Incorrect

Mark 0.00 out of 1.00

Simplify  $Y = AB' + (A' + B)C$

Select one:

- ☒ a.  $A'B + AC'$  ✗
- ☐ b.  $AB + A$
- ☐ c.  $AB + AC$
- ☐ d.  $AB' + C$

The correct answer is:  $AB' + C$

Question **9**

Correct

Mark 2.00 out of 2.00

For the given Boolean function, which one of the following is the complete set of prime implicants?

$$F(w, x, y, z) = wy + xy + \bar{w}xyz + \bar{w}\bar{x}y + xz + \bar{x}\bar{y}\bar{z}.$$

Select one:

- ☒ a.  $y, xz, \bar{x}\bar{z}$  ✓
- ☐ b.  $w, y, xz$
- ☐ c.  $y, \bar{x}\bar{y}\bar{z}$
- ☐ d.  $w, y, xz, \bar{x}\bar{z}$

Your answer is correct.

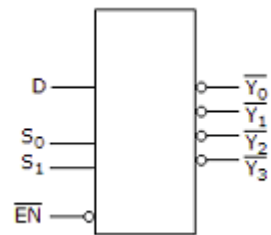
The correct answer is:  $y, xz, \bar{x}\bar{z}$

Question **10**

Correct

Mark 2.00 out of 2.00

The device shown here is most likely a \_\_\_\_\_



Select one:

- ☒ a. Demultiplexer ✓
- ☐ b. Comparator
- ☐ c. Multiplexer
- ☐ d. Inverter

Your answer is correct.

The correct answer is: Demultiplexer

Question **11**

Incorrect

Mark 0.00 out of 1.00

If  $(1011)_3 = (111)_x$  then what is the value of  $x$ ?

Select one:

- ☐ a. 4
- ☐ b. 5
- ☒ c. 2 ✗
- ☐ d. 3

The correct answer is: 5

Question **12**

Correct

Mark 2.00 out of 2.00

**Simplified expression/s for following Boolean function  $F(A, B, D) = \sum (0, 1, 2, 3, 6, 12, 13, 14, 15)$  is/are**

**(A)  $A'B' + AB + A'C'D'$**

**(B)  $A'B' + AB + A'CD'$**

**(C)  $A'B' + AB + BC'D'$**

**(D)  $A'B' + AB + BCD'$**

**Choose the correct answer from the options given below:**

Select one:

- ☐ a. B only
- ☐ b. A and B only
- ☐ c. A only
- ☒ d. B and D only ✓

Your answer is correct.

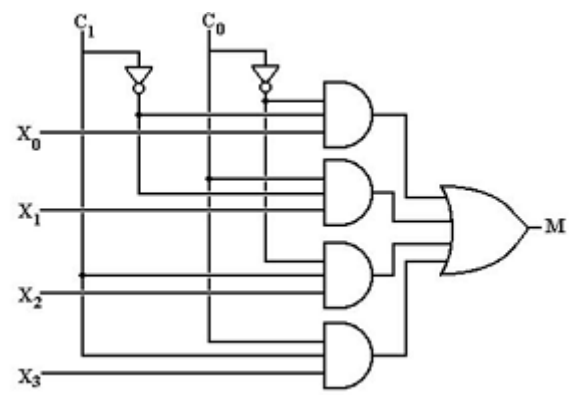
The correct answer is: B and D only

Question 13

Correct

Mark 2.00 out of 2.00

In the given 4-to-1 multiplexer, if  $c_1 = 0$  and  $c_0 = 1$  then the output M is \_\_\_\_\_



Select one:

- ☐ a. X2
- ☐ b. X3
- ☐ c. X0
- ☒ d. X1 ✓

Your answer is correct.

The correct answer is: X1

Question 14

Correct

Mark 2.00 out of 2.00

The Boolean expression for the truth table

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

Select one:

- ☐ a.  $\overline{B}(A+\overline{C})(\overline{A}+C)$
- ☐ b.  $B(A+\overline{C})(\overline{A}+C)$
- ☒ c.  $B(A+C)(\overline{A}+\overline{C})$  ✓
- ☐ d.  $\overline{B}(A+C)(\overline{A}+\overline{C})$

Your answer is correct.

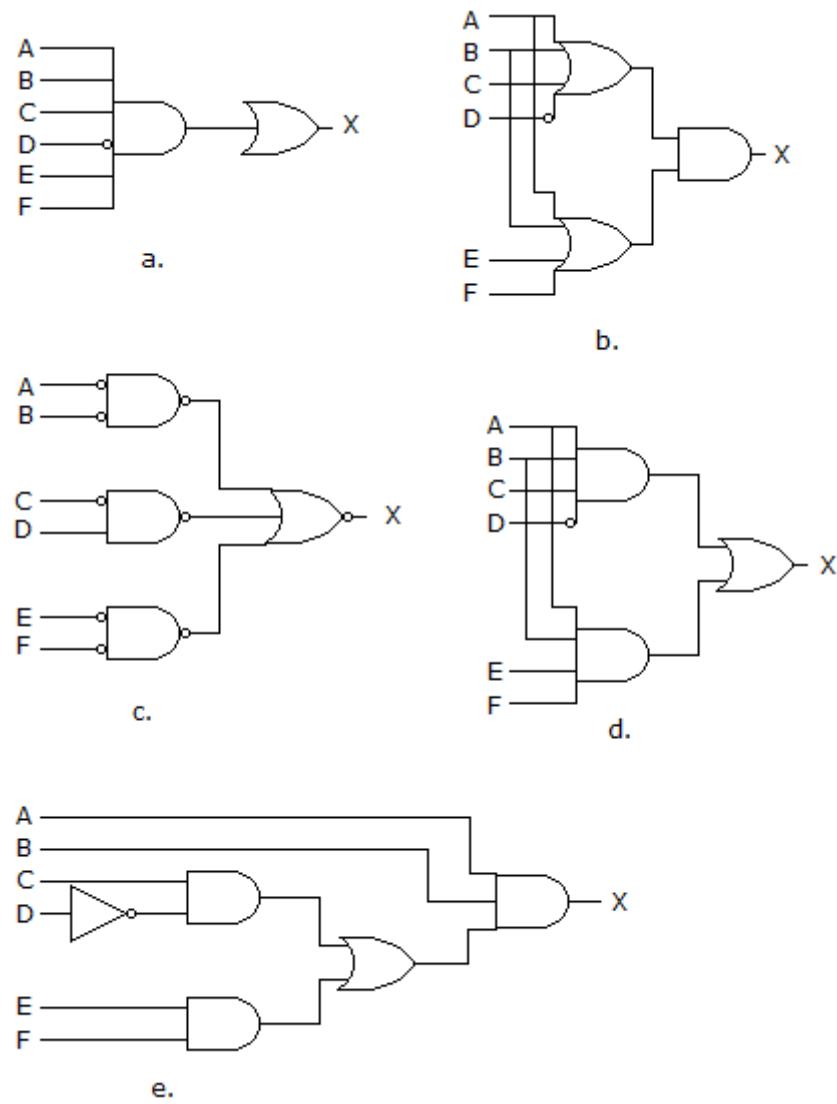
The correct answer is:  $B(A+C)(\overline{A}+\overline{C})$

Question **15**

Correct

Mark 2.00 out of 2.00

Which of the circuits in figure (a to d) is the sum-of-products implementation



Select one:

- ☐ a. c
- ☒ b. d ✓
- ☐ c. b
- ☐ d. a

Your answer is correct.

The correct answer is: d

Question **16**

Correct

Mark 2.00 out of 2.00

There are \_\_\_\_\_ cells in a 4-variable K-map.

Select one:

- ☐ a. 4
- ☒ b. 16 ✓
- ☐ c. 8
- ☐ d. 32

Your answer is correct.

The correct answer is: 16

Question **17**  
Correct  
Mark 1.00 out of 1.00

Convert the binary number  $(01011.1011)_2$  into decimal.

Select one:

- ☐ a.  $(10.9876)_{10}$
- ☒ b.  $(11.6875)_{10}$  ✓
- ☐ c.  $(11.5874)_{10}$
- ☐ d.  $(10.7893)_{10}$

The correct answer is:  $(11.6875)_{10}$

Question **18**  
Correct  
Mark 1.00 out of 1.00

Complement of the expression  $A'B + CD'$  is

Select one:

- ☐ a.  $(A' + B)(C' + D)$
- ☒ b.  $(A + B')(C' + D)$  ✓
- ☐ c.  $(A + B')(C + D')$
- ☐ d.  $(A' + B)(C' + D)$

The correct answer is:  $(A + B')(C' + D)$

Question **19**  
Correct  
Mark 1.00 out of 1.00

The mod-10 counter is also referred to as a \_\_\_\_\_ counter.

Select one:

- ☐ a. BCD
- ☐ b. ring
- ☒ c. decade ✓
- ☐ d. strobing

The correct answer is: decade

Question **20**  
Incorrect  
Mark 0.00 out of 1.00

A comparison between ring and johnson counters indicates that:

Select one:

- ☐ a. a johnson counter has more flip-flops but less decoding circuitry
- ☐ b. a ring counter has fewer flip-flops but requires more decoding circuitry
- ☐ c. a johnson counter has an inverted feedback path
- ☒ d. a ring counter has an inverted feedback path ✗

The correct answer is: a johnson counter has an inverted feedback path

Question **21**

Correct

Mark 2.00 out of 2.00

Which of the following circuit can be used as parallel to serial converter?

Select one:

- ☐ a. Decoder
- ☒ b. Multiplexer ✓
- ☐ c. Digital counter
- ☐ d. Demultiplexer

Your answer is correct.

The correct answer is: Multiplexer

Question **22**

Correct

Mark 1.00 out of 1.00

How many AND gates are required to realize  $Y = CD + EF + G$ ?

Select one:

- ☐ a. 4
- ☐ b. 5
- ☒ c. 2 ✓
- ☐ d. 3

The correct answer is: 2

Question **23**

Incorrect

Mark 0.00 out of 2.00

The K – map for a Boolean function is shown in the figure. The number of essential implicants for this function is

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

Select one:

- ☐ a. 5
- ☒ b. 3 ✗
- ☐ c. 6
- ☐ d. 4

Your answer is incorrect.

The correct answer is: 4



Question **24**

Correct

Mark 1.00 out of 1.00

How many two input AND gates and two input OR gates are required to realize Y

Select one:

- ☒ a. 3,2 ✓
- ☐ b. 2,3
- ☐ c. 4,2
- ☐ d. 1,1

The correct answer is: 3,2

Question **25**

Correct

Mark 1.00 out of 1.00

What is meant by parallel-loading the register?

Select one:

- ☐ a. Loading data in two of the flip-flops
- ☒ b. Loading data in all four flip-flops at the same time ✓
- ☐ c. Momentarily disabling the synchronous SET and RESET inputs
- ☐ d. Shifting the data in all flip-flops simultaneously

The correct answer is: Loading data in all four flip-flops at the same time

Question **26**

Correct

Mark 1.00 out of 1.00

The only function of NOT gate is to .....|

Select one:

- ☒ a. Invert input signal ✓
- ☐ b. Stop signal
- ☐ c. Act as a universal gate
- ☐ d. None of the above

The correct answer is: Invert input signal

Question **27**  
Incorrect  
Mark 0.00 out of 2.00

The K-map given below represents the bit  $G_2$  for a 4-bit Binary ( $B_4B_3B_2B_1$ ) to Gray ( $G_4G_3G_2G_1$ ) converter. What will be the expression of  $G_2$ ?

$B_4B_3 \backslash B_2B_1$					
		00	01	11	10
$B_4B_3$	00	0	0	1	1
	01	1	1	0	0
	11	1	1	0	0
	10	0	0	1	1

Select one:

- ☐ a.  $B_2 \oplus B_4$
- ☒ b.  $B_3 \oplus B_1$  ✖
- ☐ c.  $B_3 \oplus B_2$
- ☐ d.  $B_3 \oplus B_4$

Your answer is incorrect.

The correct answer is:  $B_3 \oplus B_2$

Question **28**  
Correct  
Mark 1.00 out of 1.00

What happens to the parallel output word in an asynchronous binary down counter pulse occurs?

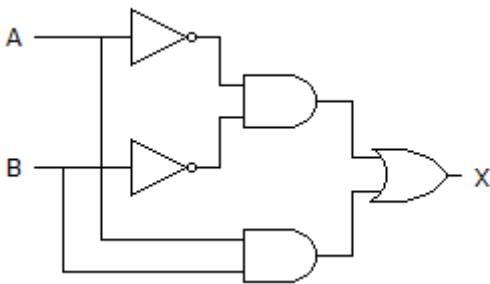
Select one:

- ☐ a. The output word increases by 2.
- ☐ b. The output word increases by 1.
- ☒ c. The output word decreases by 1. ✔
- ☐ d. The output word decreases by 2.

The correct answer is: The output word decreases by 1.

Question **29**  
Correct  
Mark 2.00 out of 2.00

What type of logic circuit is represented by the figure shown below?



Select one:

- ☐ a. AND
- ☐ b. NOR
- ☒ c. XNOR ✔
- ☐ d. XOR

Your answer is correct.

The correct answer is: XNOR

Question **30**

Correct

Mark 2.00 out of 2.00

A 32 to 1 multiplexer has the following terminals

Select one:

- ☐ a. 5 inputs 32 control signals and one output
- ☐ b. 32 outputs, one input and 5 control signals
- ☒ c. 32 inputs, one output and 5 control signals ✓
- ☐ d. 5 inputs, one control signal and 32 outputs

Your answer is correct.

The correct answer is: 32 inputs, one output and 5 control signals

Question **31**

Correct

Mark 1.00 out of 1.00

The code where all successive numbers differ from their preceding number by si

Select one:

- ☐ a. Alphanumeric Code
- ☐ b. Excess 3
- ☒ c. Gray ✓
- ☐ d. BCD

The correct answer is: Gray

Question **32**

Correct

Mark 1.00 out of 1.00

The primary difference between a counter and a register is

Select one:

- ☐ a. A counter has no particular sequence of states.
- ☐ b. A counter has the capability to store n bit of information whereas a register has one bit.
- ☒ c. A register has no specific sequence of states. ✓
- ☐ d. A register counts data.

The correct answer is: A register has no specific sequence of states.

Question **33**

Correct

Mark 1.00 out of 1.00

What is the addition of the binary number 101001+ 010011=?

Select one:

- ☒ a. 111100 ✓
- ☐ b. 010100
- ☐ c. 000111
- ☐ d. 101110

The correct answer is: 111100

Question **34**

Incorrect

Mark 0.00 out of 1.00

What is an ambiguous condition in a NAND based S' and R' latch?

Select one:

- ☐ a.  $S'=0, R'=0$
- ☒ b.  $S'=0, R'=1$  ✖
- ☐ c.  $S'=1, R'=1$
- ☐ d.  $S'=1, R'=0$

The correct answer is:  $S'=0, R'=0$

Question **35**

Correct

Mark 2.00 out of 2.00

The four variable function f is given in terms of min-terms as  $f(A, B, C, D) = \sum m(2,3,8,10,11,12,14,15)$ . Using the K-map minimize the function in the sum of products form. Also, give the realization using only two input NAND gates.

The number of NAND Gates required are?

Select one:

- ☐ a. 5
- ☒ b. 6 ✔
- ☐ c. 7
- ☐ d. 4

Your answer is correct.

The correct answer is: 6

◀ Assignment Lab - 4 on  
Counters Design

Jump to...

RAM1 ▶