Vadim Midterm Mock Paper By Wei Jhin, Xin Yong, Jazz, Thea 2021 RTIS/IMGD

1) What is the Roman number equal to 14 +V?
Answer: _____

2) What is the decimal number equal to Roman XXVI?

Answer: _____

3) What is radix of Hex numbers?
Select one:
[]8
[]1
[]16
[]10
[]2

4) Your answer for decimal 49 in Binary, Octal & Hex is …

Answer: _____

5) Your answer for decimal 242 in Binary, Octal & Hex is …

Answer: _____

6) What is the base of the hexadecimal number system and what numerals are used in this system?
Select one:
[] The hexadecimal system is a base-8 number system and it uses the digits 0 - 7 to represent numbers.
[] The hexadecimal system is a base-16 number system and it uses the digits 0 - 16 to represent numbers.
[] The hexadecimal system is a base-16 number system and it uses the digits 0 - 8 to represent numbers.
[] The hexadecimal system is a base-16 number system and it uses the digits 0 - 9 and characters A - F to represent
sixteen numerals.

7) Number 62440 can be ...
Select one or more:
[] Decimal
[] Octal
[] Binary
[] Hexadecimal

8) Number 23485 can be ...
Select one or more:
[] Decimal
[] Octal
[] Binary
[] Hexadecimal

9) Given an 8-bit binary number 10101111. Which binary number is next (incremented by 1)?
Answer: _____

10) Given an 8-bit binary number 10110000. Which binary number is previous (decremented by 1)?
Answer: _____

11) What is the weight of the 6th bit in a binary number?
Select one:
[]36
[]25
[]16
[]32
[]64
[]63

12) What is the result of expression B+6+D as a hexadecimal number?
Answer: _____

13) Your answer for decimal 174 as binary is ...
Answer: _____

14) Your answer for decimal 964 as binary is ...
Answer: _____

15) Your answer for decimal 299 as binary is ...
Answer: _____

16) Your answer for binary 110110111 as decimal is ...
Answer: _____

17) Your answer for binary 101011001 as decimal is ...
Answer: _____

18) Your answer for binary 101110111 as decimal is ...
Answer: _____

19) Your answer for hexadecimal 19B as decimal is ...
Answer: _____

20) Your answer for hexadecimal 1AC as decimal is ...
Answer: _____

21) Your answer for hexadecimal A61 as decimal is ...

Answer: _____

22) Your answer for hexadecimal B6D as binary is ...
Answer: _____

23) Your answer for hexadecimal 1C7 as binary is ...
Answer: _____

24) Your answer for hexadecimal E0F as binary is ...

Answer: _____

25) Your answer for octal 543 as binary is ...
Answer: _____

26) Your answer for octal 403 as binary is ...
Answer: _____

27) Your answer for octal 723 as binary is ...
Answer: _____

28) Perform the following unsigned binary additions.
1001010+1010110
Answer: _____

29) Perform the following unsigned binary additions.
11101010+1001001
Answer: _____

30) Perform the following unsigned binary additions. (overflow)
11111111+10000001
Answer: _____

31) Perform the following signed binary additions. (Sign magnitude)
0110010+10000011

Answer: _____

32) Perform the following signed binary additions. (Sign magnitude)
0111010+10001001
Answer: _____

33) Convert decimal 280 to binary number.

Answer: _____

34) Convert binary 101010101 to decimal number.

Answer: _____

35) Convert hexadecimal 1A6 to decimal number.

Answer: _____

36) Convert hexadecimal BC1 to binary number.

Answer: _____

37) Convert octal 407 to binary number.

Answer: _____

1) SOP1
For the given truth table write down the SOP form of X.
A B C X
0 0 0 0
0 0 1 1
0 1 0 0
0 1 1 1
1 0 0 0
1 0 1 0
1 1 0 0
1 1 1 1
Correct input example: ABC+A'B'C'. Ordered alphabetically. No spaces between letters

Answer: _____

38) SOP2
For the given truth table write down the SOP form of X.
A B C X
0 0 0 1
0 0 1 0
0 1 0 0
0 1 1 1
1 0 0 0
1 0 1 0
1 1 0 1
Correct input example: ABC+A'B'C'. Ordered alphabetically. No spaces between letters
Answer: _____

39) POS1
For the given truth table write down the POS form of X.
A B C X
0 0 0 0
0 0 1 1
0 1 0 0
0 1 1 1
1 0 0 0
1 0 1 1
1 1 0 0
1 1 1 0
Correct input example: (A+B+C)(A'+B'+C'). Ordered alphabetically. No spaces between letters
Answer: _____
40) POS2
For the given truth table write down the POS form of X.
A B C X
0 0 0 0
0 0 1 1
0 1 0 0
0 1 1 1
1 0 0 0
1 0 1 1
1 1 0 0
1 1 1 0
Correct input example: (A+B+C)(A'+B'+C'). Ordered alphabetically. No spaces between letters

Answer: _____

41) SIM1
Simplify the following Boolean expression and choose the best answer.
(A 0)+(A 1)+(A 0)'+(A 1)'

42) SIM2
Simplify the following Boolean expression and choose the best answer.
(A+B+C)(D+E)' + (A+B+C)(D+E)

43) SIM3
Simplify the following Boolean expression and choose the best answer.
XZ+Z(X'+XY)

44) SIM4
Simplify the following Boolean expression and choose the best answer.
(A+B)'(C+D+E)'+(A+B)'

45) SIM5
Simplify the following Boolean expression and choose the best answer.
A'B'+C'+D'+E'

46) SIM6
Simplify the following Boolean expression and choose the best answer.
AB+ABC+ABCD+ABCDE+ABCDEF

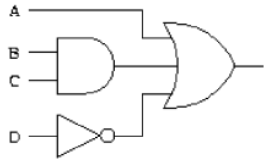
47) SIM7
Simplify the following Boolean expression and choose the best answer.
(X+Z)(X'+Y)(Z+Y)

48) SIM8
Simplify the following Boolean expression and choose the best answer.
X'+Y'+XYZ'

49) SIM9
Simplify the following Boolean expression and choose the best answer.
(A+C)(AD+AD')+AC+C

50) SIM10
Simplify the following Boolean expression and choose the best answer.
A(A+B'C)+A(B'+C)

51) Write down the Boolean expression of Output strictly followed by each circuit. Use A, B, C, D, +, and ' only. Avoid using
whitespaces. Use ( ) only when necessary. Order operands alphabetically.



Answer: _____

52) How do you make a NOR gate out of an NAND gate using inverters (NOT gates)?
Select one:
[]Invert both the inputs and output of the NAND gate
[]Invert one of the inputs to the NAND gate
[]Invert the output from the NAND gate

[]Invert both the inputs to the NAND gate

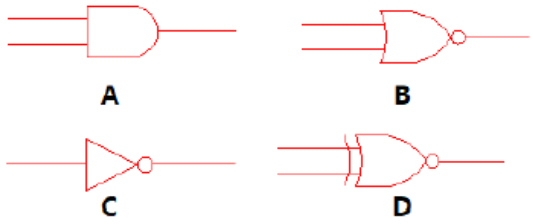
53) How do you make a NAND gate out of an AND gate using inverters (NOT gates)?
Select one:
[]Invert one of the inputs to the AND gate
[]Invert both the inputs to the AND gate
[]Invert both the inputs and output of the AND gate
[]Invert the output from the AND gate

54) How do you make an OR gate out of an AND gate using inverters (NOT gates)?
Select one:
[]Invert both the inputs and output of the AND gate
[]Invert the output from the AND gate
[]Invert both the inputs to the AND gate
[]Invert one of the inputs to the AND gate

55) What does connecting together the inputs of NAND and NOR gates do?
Select one:
[]Produce a OR gate
[]Produce a NAND gate
[]Produce a XOR gate
[]Produce a NOT gate

56) What does an XOR gate do?
Select one:
[]Give a low output when one or more of its inputs are high
[]Give a low output when only one of its inputs is high
[]Give a high output when only one of its inputs is high
[]Give a high output when one or more of its inputs are high

57) What do the following symbols represent in the given order?



Select one:
[]OR NAND NOT XNAND
[]OR NAND NOT NXAND
[]NOR AND NOT XAND
[]AND NOR NOT XNOR
[]AND NOR NOT NOR
[]NAND OR NOT XOR

58) **Which one of the following truth tables represents the behavior a NAND gate?**

A.

2 Input NAND gate		
A	B	A.B
0	0	0
0	1	1
1	0	1
1	1	0

C.

2 Input NAND gate		
A	B	A.B
0	0	0
0	1	0
1	0	0
1	1	1

B.

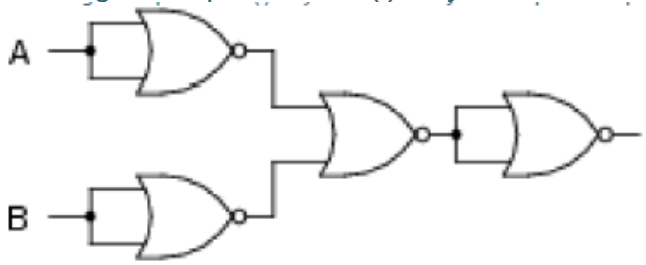
2 Input NAND gate		
A	B	A.B
0	0	1
0	1	0
1	0	0
1	1	0

D.

2 Input NAND gate		
A	B	A.B
0	0	1
0	1	1
1	0	1
1	1	0

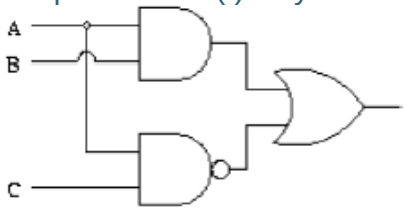
Select one:
[]A
[]B
[]C
[]D
[]None of the above

59) Write down the Boolean expression in simplest form of Output strictly followed by each circuit.
Use A, B, +, and ' only.
Avoid using whitespaces. Use ( ) only when necessary. Order operands alphabetically.



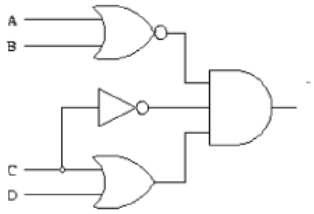
Answer: _____

60) Write down the Boolean expression of Output strictly followed by each circuit. Use A, B, C, +, and ' only. Avoid using
whitespaces. Use ( ) only when necessary. Order operands alphabetically.



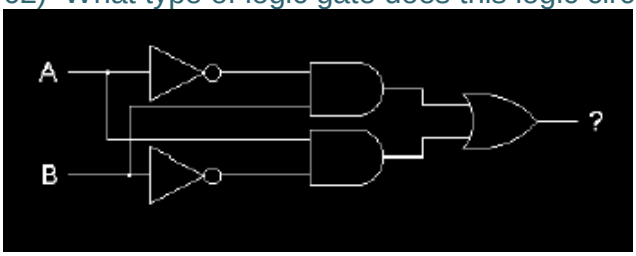
Answer: _____

61) Write down the Boolean expression of Output strictly followed by each circuit. Use A, B, C, D, +, and ' only. Avoid using
whitespaces. Use ( ) only when necessary. Order operands alphabetically.



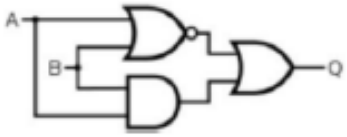
Answer: _____

62) What type of logic gate does this logic circuit configuration produce?



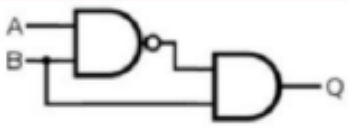
Select one:
[]NAND gate
[]NOR gate
[]XNOR gate
[]XOR gate

63) Write down the Boolean expression of Q form strictly followed by each circuit. Use A, B, +, and ' only. Avoid using
whitespaces. Use ( ) only when necessary. Order operands alphabetically. DO NOT SIMPILY the result



Answer: _____

64) Write down the Boolean expression of Q strictly followed by each circuit. Use A, B, +, and ' only. Avoid using whitespaces.
Use ( ) only when necessary. Order operands alphabetically. DO NOT SIMPLIFY the result.



Answer: _____

65) What is the decimal value of 8-bit binary number **10101011** expressed in signed magnitude representation?

Answer: _____

66) What is the decimal value of 8-bit binary number **10101011** expressed in ones complement representation?

Answer: _____

67) What is the decimal value of 8-bit binary number **10101011** expressed in twos complement representation?

Answer: _____

68) What is the decimal value of the 8-bit ones' complement number **1011 0100** ?

Answer: _____

69) What is the decimal value of the 16-bit ones' complement number **1101 1101 1011 1102** ?

Answer: _____

70) What is the decimal value of the 8-bit twos' complement number **1011 0100** ?

Answer: _____

71) What is the decimal value of the 16-bit twos' complement number **1101 1101 1011 1102** ?

Answer: _____

72) What is the decimal value of the 32-bit two's complement number **1111 1111 1111 1111 1111 1111 1101 1101** ?

Answer: _____

73) Compute the decimal value of the 16-bit one's complement number **f2b9** . **Ensure that your answer contains only the necessary decimal digits and a minus symbol (if required).**

Answer: _____

74) Compute the decimal equivalent of the 16-bit two's complement number **A6B9** . **Ensure that your answer only**
contains decimal digits and a minus symbol (if required).

Answer: _____

75) Write the 8-bit hexadecimal representation of **-95** using two's complement notation. Express the 8-bit hexadecimal
number using a set of 2 hexadecimal digits. **Ensure that your answer contains exactly two hexadecimal digits. Using**
case is unimportant: for example, ab and AB both correct hex numbers.

Answer: _____

76) Compute the 8-bit hexadecimal representation of **181** using two's complement notation. Express the 8-bit hexadecimal
number using a set of 2 hexadecimal digits. **Ensure that your answer contains exactly two hexadecimal digits. Using**
case is unimportant: for example, ab and AB both correct hex numbers.

Answer: _____

J1 which are positional numbering systems
[]binary
[]octal
[]decimal
[]hex
[]roman
[]mose code

J2 What is 6A + F2 in decimal

Ans_____

J3 what is 45 + 20 (base 8) in Binary

Ans_____

J4 What is 47 (octal) in Hex

Ans_____

J5 127 (octal) in Decimal

Ans_____

J6 99 in octal

Ans_____

J7 What is 1011 X 1101 in binary

Ans_____

J8 What is 1000 / 0010

Ans_____

J9 What is the table for A XNOR B

A	B	A XNOR B
0	0	
0	1	
1	0	
1	1	

J10 Draw half adder 10 times (Vadim say one)

A-----

B----- -------Sum

--------Carry

J11 Draw full adder 10 times (Vadim say one)

A----------

B---------- -------Sum

Carry in---

--------Carry

J12 Draw N bit adder
Denote Full adder with [FA]

J13 What is the complementary representation for A (hex)

Ans_____

J14 Convert -69 to twos complement in Octal

Ans_____

J15 Convert FF1A to sign decimal

Ans_____

By Wei Jhin, Xin Yong, Jazz, Thea 2021 RTIS/IMGD