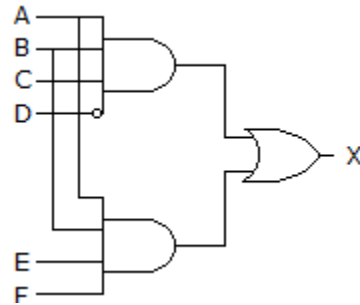
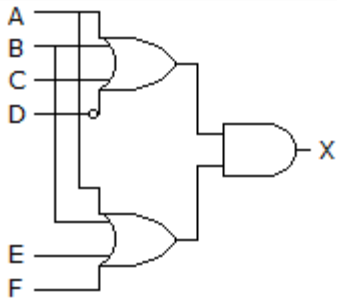


1. The representation of octal number $(532.2)_8$ in decimal ? write it's process.

2. According to the Boolean law, express these expressions final results.

$$A + 1 = ?; \quad A(A + B) = ?; \quad (A + B)(A' * B') = ?$$

3. Please write these logic gate's Boolean expression and truth table, and minimize results of expressions.(use K-map)



4. The decimal equivalent of the binary number $(1011.011)_2$ is ? write it's process.

5. Simplify $Y = AB' + (A' + B)C$.(use K-map)

6. What is the SOP and POS? Please give an example.

7. Representation of hexadecimal number $(6DE)_H$ in decimal ? write it's process.

8. Construct a truth table for the following functions:

$$(a) h(A,B,C,D) = A'BC' + (A \oplus B)C + A'B'CD' + ABC$$

$$(b) j(A,B,C,D) = A'C'D' + C'D + CD$$

9. What is the Floating-point number? How to express it in the computer system? (32 bit memory system)

10. Convert $(0.345)_{10}$ into an octal number? write it's process.

11. How many two input AND gates and two input OR gates are required to realize $Y = BD + CE + AB$? Why? Please draw it's logic circuit.

12. What did you think about the concept of «Memory caching»? please give some example.

13. Convert the hexadecimal number (1E2)₁₆ to decimal? write it's process.

14. How many two-input AND and OR gates are required to realize $Y = CD+EF+G$? Please draw it's logic circuit.

15. According to the each of K-maps, determine the minimal SOP expressions, and draw it's logic circuit.

	A'B' 00	A'B 01	AB 11	AB' 10
C'D' 00	0	0	0	1
C'D 01	0	0	1	1
CD 11	1	0	1	1
CD' 10	1	0	0	1

	A'B' 00	A'B 01	AB 11	AB' 10
C' 0	1	1	0	1
C 1	0	1	1	0

15. Perform binary addition: $101101 + 011011 = ?$ write it's process.

16. In these four states, which of the DeMorgan's theorem states ? Why?

a) $(AB)' = A' + B'$ b) $(A + B)' = A' * B$ c) $A' + B' = A'B'$ d) $(AB)' = A' + B$

17. There are five types of latches, such as SR latch, D latch, JK latch, T latch and D latch. Please To describe the SR latch's memory state.

18. Perform binary subtraction: $101111 - 010101 = ?$ write it's process.

19. What is a Memory system? What is a ROM and RAM?

20. According to the each of K- maps each of the K-maps, determine the SOP minimal expressions associated with it's result.

	A' 0	A 1
B' 0	1	1
B 1	1	0

	A'B' 00	A'B 01	AB 11	AB' 10
C'D' 00	1	1	1	1
C'D 01	1	1	1	0
CD 11	0	0	1	1
CD' 10	0	0	1	1

21. Why we say about all logic operations can be obtained by means of NOR and NAND? Please give an example.

22. On addition of 28 and 18 using 2's complement, the result is? write process and explain it.

23. Perform multiplication of the binary numbers: $01001 \times 01011 = ?$

24. Divide the binary number (011010000) by (0101) and find the quotient

25. What is a Karnaugh map (K-map)? Please give an example.

26. Why latches are called a memory devices? For example.

27. 1's complement of 1011101 is ? write process and explain it.

28. According to the each of K-maps, determine the SOP minimal expressions associated with it's result.

	A'B' 00	A'B 01	AB 11	AB' 10
C'D' 00	0	0	0	0
C'D 01	1	1	0	1
CD 11	0	1	0	1
CD' 10	1	1	0	0

	A'B' 00	A'B 01	AB 11	AB' 10
C' 0	1	1	1	1
C 1	0	1	0	0

29. What do you think about the «Encoder»? please to describe it.

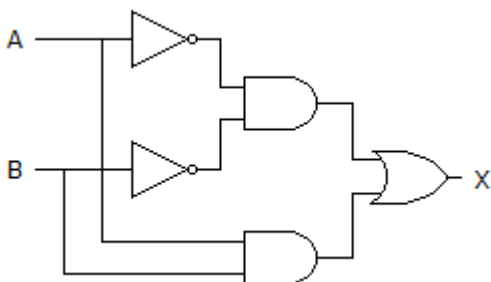
30. 2's complement of 11001011 is ? write process and explain it.

31. What is the complement of the expression $A'B + CD'$? please write it's truth table and k_map.

31. What is An overflow and in which case An overflow occurs ?

32. On subtracting $(01010)_2$ from $(11110)_2$ using 1's complement, the result is ? write process and explain it.

33. Please write these logic gate's Boolean expression and truth table.



34. What is combinational and sequential logic circuit? Please draw their logic scheme.

35. On subtracting $(010110)_2$ from $(1011001)_2$ using 2's complement, the result is ? write process and explain it.

36. How many AND gates are required to realize $Y = CD + EF + G$? Please draw its logic circuit.

37. What are the differences between Real Time System and Timesharing System?

38. On addition of +38 and -20 using 2's complement the result is ? write process, and explain it.

39. Construct the K-map for each of the functions following expressions and determine the minimal expression for each.

(a) $f(A,B,C) = AB + A'BC' + AB'C$

(b) $g(A,B,C) = A'C + ABC + AB'$

40. Please describe the procedure for the design of combinational circuits.

41. On addition of -46 and +28 using 2's complement, the result is ? write the process, and explain it.

42. Construct a truth table for the following functions, and draw their logic gates.

(a) $f(A,B,C) = AB + A'BC' + AB'C$

(b) $g(A,B,C) = A'C + ABC + AB'$

43. Please describe the works of Memory system.

44. What is the advantage of 2's complement system ? please give an example.

45. please write this expression $Y=AB+BC+AC$ truth table, then draw its two level logic circuit.

46. How many cells in a 4-variable K-map? Why? To draw its map and explain it.

47. Use rules of Boolean algebra to minimize following expressions:

$$F=AB+A'C \quad F=ABC+AB'C+AB+BC'$$

48. Are Memories classified into how many categories? Please describe each other.

49. What is the Minterm and Maxterm? Please give an example.

50. Please write this expression $Y=(A+B)(B+C)(C+A)$ truth table, then draw its two level logic circuit.

51. What is the Flip-flop? Please draw S-R flip-flop logic scheme and to explain it.

52. Please describe the procedure for the design of sequential logic circuits.

53. The Boolean expression $Y = (AB)'$ is logically equivalent to what kind of single gate? Why?

54. According to these expressions Boolean to draw its corresponding a truth table and a Logic gate.

$$F=AB+A'BC+AC \quad F=(A+B+C')(B+C)(A'+C)$$

55. To describe the difference between the latch and Flip-flop?

56. Construct the K-map for each of the functions following expressions and determine the minimal expression for each.

(a) $h(A,B,C,D) = A'BC' + (A \oplus B)C + A'B'CD' + ABC$

(b) $j(A,B,C,D) = A'C'D' + C'D + CD$

57. Please draw S-R latches logic circuit and explain its each case.

58. What are the possible groupings in a 4-input K-map? Sketch their shapes.

59. $h(A,B,C,D) = A'BC' + (A \oplus B)C + A'B'CD' + ABC$, design the circuit for the minimal SOP expression and using just NAND gates and inverters.

60. When, In J-K flip-flop, “no change” condition? please explain it.

61. Please describe the difference between Floating-point number and Fixed-point number.

62. $g(A,B,C) = A'C + ABC + AB'$, design the circuit for the minimal SOP expression and using just NAND gates and inverters.

63. Calculate the following arithmetic expressions.(please to use the rules of fixed-point number,and verify it's final result)

$$a=12.4, i=11, f=5; \quad b=23.45, i=12, f=4;$$

(1) $c=a+b$; (2) $c1=a*b$;

64. Please characterize the processor and microprocessor.

65. According to the Boolean expression, construct a K-map and determine the minimal SOP expressions, and draw it's SOP logic circuit.

a. $f(a,b,c) = a'b'c' + a'bc' + abc' + abc$ b. $g(a,b,c) = ab'c' + abc' + abc$

66. If a Memory system can only save 4 bit information, ask: can you will use how many Flip-Flops? Why? Please draw it's logic scheme.(S-R Flip-flop)

67. What is the interrupt system? Please give one example, and describe it.

68. According to the Boolean expression, construct it's K-map and determine the minimal SOP expressions, and draw it's SOP logic circuit.

c. $k(a,b,c,d) = abc'd + ab'c'd + a'bc'd + a'b'cd'$

d. $m(a,b,c,d) = a'b'cd' + a'bcd' + abc'd' + abcd' + ab'c'd' + ab'cd'$

69. Calculate the following arithmetic expressions.(please to use the rules of fixed-point number,and verify it's final result)

$$a=11.32, i=10, f=6; \quad b=15.45, i=9, f=3;$$

(1) $c=a-b$; (2) $c1=a*b$;

70. What is the relationship between operating systems and computer hardware?