QUESTION BANK CS PAPER II

Q1. MCQ Based Questions

1. What is meant of this equation $x \cdot y = y \cdot x$?

a) associative law b) identity law c) commutative law d) inverse property Ans c)

2. Which expression is the distributive law of Boolean algebra?

$A \cdot (B + C) = A \cdot B + A \cdot C$ b) $(A + B) + C = A + (B + C)$

c) $A \cdot (B \cdot C) = (A \cdot B) + C$ d) $A \cdot (B \cdot C) = (A \cdot B) \cdot (A \cdot C)$ Ans. a)

3. $A + B = B + A$; $A \cdot B = B \cdot A$ represent which laws?

a) Commutative b) Associative c) Distributive d) Idempotent Ans. a)

4. $A \cdot (B + C) = A \cdot B + A \cdot C$; $A + B \cdot C = (A + B) \cdot (A + C)$ represent which laws?

a) Commutative b) Associative c) Distributive d) Idempotent Ans. d)

5. The dual of a Boolean expression is obtained by

a. interchanging all '+' and '.' Signs

b. interchanging all 0s and 1s, all + and '.' Signs

c. interchanging all 0s and 1s, all + and '.' signs and complementing all the variables

d. interchanging all + and '.' signs and complementing all the variables Answer: B.

6. Which of the following is/are the universal logic gate(s)?

a) AND and OR b) AND, OR and NOT c) NAND and NOR d) NOT Ans. c)

7. The expression of a NAND gate is__

a) $A \cdot B$ b) $A' \cdot B + A \cdot B'$ c) $(A \cdot B)'$ d) $(A + B)'$ Ans. c)

8. A __gate gives the output as 1 only if all the inputs signals are 1.

a) AND b) OR c) Ex-OR d) NOR Ans. a)

9. The gate which is used to reverse the output obtained is _____

a) NOR b) NAND c) Ex-OR d) NOT Ans. d)

10. The symbol + in Boolean is also known as the _____operator.

a) AND b) OR c) Ex-OR d) NOR Ans. b)

11. NAND is a complement of

a) AND b) OR c) NOT d) XOR Ans. a)

12. The output of a NOR gate is high

a) Only when all the inputs are low b) Only when all the inputs are high

c) Only when at least one input is high d) Only when at least one input is low Ans. a)

13. The output of a NAND gate is low

a) only when all the inputs are low b) only when all the inputs are high

c) only when at least one input is high d) only when at least one input is low Ans. b)

14. An AND gate can be imagined as

a) switches connected in series b) switches connected in parallel

c) switches connected in criss-cross d) switches connected in circular Ans. a)

15. An OR gate can be imagined as

a. switches connected in series

b. switches connected in parallel

c. transistors connected in series

d. transistors connected in parallel Answer: switches connected in parallel

16. The output of a gate is LOW when at least one of its inputs is HIGH. This is true for

a. AND b. NAND c. NOR d. OR Answer: NOR

17. The output of a logic gate is 1 when all its inputs are at logic 1. The gate is either

a. a NAND or a NOR b. an AND or an OR

c. an OR or an X-OR d. an AND or a NOR Answer: an AND or an OR

18. In which binary operation carry is obtained?

a) Subtraction b) Addition c) Multiplication d) Both addition and subtraction Ans. b)

19. In Boolean algebra, (1 + x + x')' =?

a) 1 b) 0 c) x d) x'

20. A bubble gate is

a) NOT gate b) an inverter c) both a and b d) There is no such gate

21. When we convert 10010 binary numbers to decimals. Then the solution is :

a) 20 b) 18 c) 14 d) 16 Ans. b) 18

22. Convert $(22)_8$ from octal to its corresponding decimal equivalent.

20 b) 18 c) 14 d) 81 Ans. b) 18

23. Name the number system which uses alphabets as well as numerical.

a) Binary number system b) octal number system

c) Decimal number system d) Hexadecimal number system Ans. d)

24. Which out of the following binary number is equivalent to decimal number?

a) 11011 b) 11000 c) 11111 d) 11001 Ans. b)

25. How many digits are there in octal number system?

a) 6 b) 9 c) 5 d) 8 Ans. d) 8

26. One nibble contains _____number of bits

a) 3 b) 4 c) 8 d) 16 Ans. b) 4

27. Conversion of hexadecimal number (69)16 to octal equivalent will be

a) 451 b) 351 c) 251 d) 151 Ans. d) 151

28. Convert the binary number $(100110)_2$ to hexadecimal equivalent is give

a) 46 b) 36 c) 26 d) 34 Ans.c) 26

29. When we convert 0010010100 binary to octal. Then the solution is:

a) 201 b) 226 c) 224 d) 161 Ans. c) 224

30. Convert hexadecimal $(FACE)_{16}$ to its equivalent binary

a) 1111101011001110 b) 0011101011010011

c) 1100111111100011 d) 101010101101111 Ans. a)

31. Idempotent Law in Boolean algebra is ____

a) x + x = x b) x + x' = 1 c) x · x = x d) both a and c Ans. d)

32. Identity Law in Boolean algebra is _____

a) x + x = x b) x · x = x c) x + 0 = x d) All of these Ans. c)

33. Identity Law in Boolean algebra is _____

a) 1 · x = x b) x + 0 = x b) both a and b d) None of these Ans. b)

Q. 2. Answer in short. (2 marks)

1. Explain 'base' of number systems with examples.
2. What is the value of base of Binary, Octal and hexadecimal number systems.
3. How is a number in binary number system converted into its equivalent decimal system?
4. Explain Decimal to binary conversion.
    a. $(10110011100001011)_2$
    b. $(1110110)_2$
    c. $(110011001)_2$
5. Write in tabular form values of decimal numbers 0 to 30 and their equivalents in binary and Hexadecimal
6. Write in tabular form values of decimal numbers 0 to 7 and their equivalents in octal
7. What is ones and twos complement. Give examples.
8. What are logic gates?
9. Name the universal gates.
10. Define Ex-OR logic.
11. What is a gate? What are different types of gates, mention various gates under each type.
12. Consider (A) = 5A H, (B) = C3 H, show with working, the result of following operations –
    a. ANDing operation on A and B
    b. ORing operation on A and B
    c. Ex-ORing on A and B
    d. NANDing operation on A and B
13. (Practise similar examples with different Hex data and different operations)

14. Convert DABBAA H, FE H and 12345 H in Octal numbers.
15. Explain with definition, diagram, working and truth table:
    a. AND gate
    b. OR gate
    c. Ex-OR gate
    d. NAND gate
    e. NOR gate
    f. Ex-NOR gate (3 marks each)
16. With 2 (or 3) distinct points, differentiate Inclusive OR and Exclusive OR gate. (2 / 3)
17. State both the laws of De-Morgan's in Boolean algebra. Prove any one law using truth table.
18. State distributive law in Boolean algebra. Prove any of these laws using truth table.
19. State and explain commutative law (or associative law) in Boolean algebra.
20. Convert each binary number to its decimal equivalent. 1.10110 2. 110011001 3.100101110110
21. Convert each decimal number to its binary equivalent. 1.11234 2. 458 3. 76
22. Convert each octal number to its hexadecimal equivalent 1.640_8 2.756_8 3. 315_8
23. Convert each hexadecimal number to its octal equivalent
    a. AA42
    b. 1FADE
    c. BA156

Q. 3 Perform the following binary addition

1. $(111010101010 + 11010000111 + 1010111011)_2$
2. $(1111+1001+1111 + 0011)_2$
3. $(10101 + 11001 + 01111)_2$
4. $(10101 + 11010 + 111)_2$

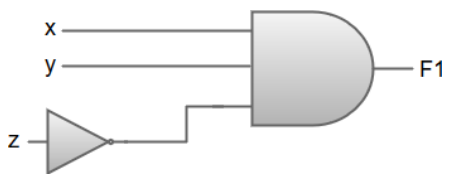
Q4. Add 3 digit max number in Hexa with 2 digit Max number in Octal with 4 digit max Number in Binary. Express the sum in decimal.

Q5. Convert the following hexadecimal to binary

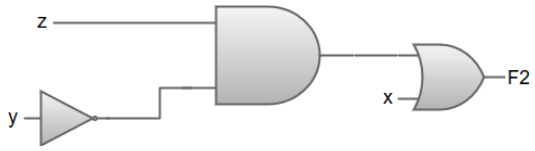
1. C0FFEE
2. 6A7
3. 2BAD
4. BED

Q6. Solve the following circuit diagram

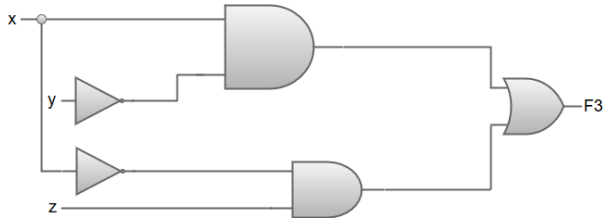
1]



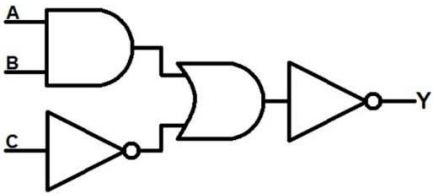
2]



3]



4]



Q7. Realize (draw) the Boolean Expression $\overline{BC}$ + A + (A + C) using logic gates Realize (draw) the Boolean Expression X + YZ using logic gates

Q8. Realize (draw) the Boolean Expression $\overline{(A+B)}$ + (A.B) using logic gates (Examples ….in q paper other diagrams can also be given.)

Q8. Fill in the blanks and rewrite the sentences.

1. The base of a number system is _____.
2. In the number 4657, if the number 7 is called as least Significant digit, then the number 4 is called as_____.
3. Binary equivalent of hexadecimal number 76A is _____.
4. is a valid number in Hexadecimal Number System.

5. In Octal number system, before the number comes the Octal number 67.
6. The max value of a digit in Octal number system is
7. The max value of a digit in Hexadecimal number system is
8. The Min 2-digit Octal Number is _____
9. The Min 3-digit Hex Number is _____
10. 1-bit sum of binary bits 1 with 1 is ____
11. Full form of 'bit' is ____
12. Which is typically the longest and the smallest :- bit, byte, nibble, word?
13. What is a group of four bits known as ?
14. Arrange the following numbers in ascending order. (1100) 2 , (1001)2 , (1011)2

Q9. Solve the following. and Show steps for every solution/ conversion]

1) $(ABCA)_{16} = (?)_{10}$ 2) $(175751)_8 = (?)_{10}$

3) $(1717)_{10} = (?)_8$ 4) $(40512)_6 = (?)_{10}$

5) $(16119)_{10} = (?)_{16}$ 6)$(101110)_2 = (?)_8$

Q10. Solve ANY TWO of the following and show steps for every solution/ conversion

1. Is the number 12101130 a binary number? Explain.
2. Is the number 121FAD a Hexadecimal number? Explain.
3. Which is the larger number, $(11111)_2$ or $(111)_{10}$? Why?
4. $(2FAF)_{16} = (?)_8 = (?)_2$
5. $(2ABCD)_{16} = (?)_2$
6. $(110110)_2 = (?)_{10}$
7. Convert the Decimal number 255 to its equivalent Binary, Octal, Hexadecimal number.
8. Convert the decimal number 112000 in Hexa
9. Convert the decimal number 100000 in Octal
10. Convert the decimal number 201000 in binary
11. Convert the binary number 1011001110110111 1 into decimal
12. What are universal gates? Explain any one with logic diagrams.
13. Define and explain the AND and OR logic gates with truth table and symbol.
14. Explain the EX-OR gate.
15. Binary subtraction using 2's complement method
16. (1) 1001001-11101101 (2)111110001-100110
17. Explain De-Morgan's Theorems
18. Explain the associative law.

Q11. Solve ANY TWO of the following and show steps for every solution/ conversion

1) $(371)_{16} = (?)_8$

2) $(4CAE)_{16} = (?)_8$

3) $(6751)_8 = (?)_2$