SOME SAMPLE QUESTION

1. What is the radix used in the case of decimal, binary, octal and hexadecimal ?
2. Write a note on BCD code.
3. Distinguish between binary code from BCD code.
4. What is a gray code ? What are its main characteristics ?
5. What is alphanumeric code ?
6. Write notes on :
   (i) ASCII code
   (ii) EBCDIC code
7. What is difference between binary and BCD number system ?
8. Explain gray code system with suitable example.

9. Convert the following binary numbers into decimal, octal and hexadecimal.
   (a) (i) 1101, (ii) 110010, (iii) 10101010,
   (iv) 11111111, (v) 11011011, (vi) 111000
   (b) (i) 1101.11, (ii) 1010.001, (iii) 1001.111.
10. Convert the following decimal numbers into binary, octal and hexadecimal.
    (a) (i) 95, (ii) 123, (iii) 221, (iv) 252, (v) 529, (vi) 445.
    (b) (i) 33.87, (ii) 89.85, (iii) 107.23.
11. Convert the following octal numbers into decimal, binary and hexadecimal.
    (a) (i) 11, (ii) 82, (iii) 105, (iv) 187, (v) 256, (vi) 519.
    (b) (i) 18.19, (ii) 53.35, (iii) 128.85.
12. Convert the following hexadecimal numbers into decimal, binary and octal.
    (a) (i) 1E, (ii) ABC, (iii) F2, (iv) A99, (v) 23C, (vi) C92.
    (b) (i) AE.35, (ii) 98.B2, (iii) C1.77.
13. Convert the following numbers in BCD code.
    (i) 72, (ii) 365, (iii) 593

14. Convert the following numbers to gray code.
    (i) 01001, (ii) 101101, (iii) 10110110.
15. Solve the following
    (i) $(77)_{10} = (?)_8$, (ii) $(99)_{10} = (?)_{16}$, (iii) $(1011101) = (?)_{16}$
    (iv) $(FA)_{16} = (?)_{10}$
16. What is positive and negative logic level ? Explain with ideal pulse.
17. What is a BCD code ? Convert decimal number $(14)_{10}$ to BCD and to binary.
18. What is gray code, write gray code for decimal 14.
19. Convert the following : (i) $(2003)_{10} = (\ldots)_{16}$, (ii) $(0.8)_{10} = (\ldots)_2$.
20. What is a weighted number system ? Give any example of such a system.
21. Which logic gates are known as universal gates ? Draw their symbols.
22. (i) $(27)_{10} = (?)_{BCD}$
    (ii) $(396)_{10} = (?)_{Excess\text{-}3}$
    (iii) $(1001)_2 = (?)_{Gray}$
    (iv) $(1001)_{Gray} = (?)_{Binary}$
23. Perform the following :

(i) $(23.85)_{10} = (?)_2$

(ii) $(E8D6)_{16} = (?)_8$

(iii) $(-12)_{10} = (?)_2$

(iv) $(1111\ 1010)_2 + (1000\ 0111)_2 = (?)_2$

24. Convert $(123.746)_{10} = (?)_8$.
25. What is positive and negative logic level ?
26. Convert decimal number 37.2 into binary number.
27. Convert $(E4)_{16} = (?)_8$.
28. Perform the following conversions :

(i) $(954.61)_{10} = (?)_{BCD}$

(ii) $(153)_8 = (?)_{16}$

(iii) $(1011)_2 = (?)_{16}$

(iv) $(121)_{10} = (?)_{Excess\text{-}3}$

29. Do the following :

(i) $(11101.011)_2 = (?)_{10}$

(ii) $(359)_{10} = (?)_8$

(iii) $(37.12)_8 = (?)_2$

(iv) $(2AB)_{16} = (?)_2$

30. List any two number systems. Write their corresponding bases.

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31. Perform the following conversions :

(i) $(36)_{10} = (?)_{Excess\text{-}3}$

(ii) $(110111)_2 = (?)_{Gray}$

(iii) $(3F8B)_{16} = (?)_2$

(iv) $(759)_{10} = (?)_{BCD}$

32. Convert $(168)_{10}$ into octal and hex.
33. What is the radix used in the case of binary and hexadecimal ?
34. Convert $(8.5625)_{10}$ to binary.
35. Convert $(143)_{10}$ into binary and hexadecimal.
36. Write a short note on ASCII and BCD codes.
37. Convert Binary to gray : 10110, 11011.

38 . Perform the following :

(i) $(10110)_2 = (?)_{10}$

(ii) $(F0B6)_{16} = (?)_2$

(iii) $(589)_{10} = (?)_{BCD}$

(iv) $(123)_{10} = (?)_{Excess\text{-}3}$.

39. Perform the following :

(i) $(1101)_{Gray} = (?)_{Binary}$.

(ii) $(1000)_{Binary} = (?)_{Gray}$.

(iii) $(291)_{10} = (?)_{Excess\text{-}3}$.

(iv) $(97)_{10} = (?)_{BCD}$.

40. Perform the following :

(i) $(11011)_2 = (?)_{10}$

(ii) $(9806)_{10} = (?)_{16}$

(iii) $(F8A)_{16} = (?)_2$

(iv) $(481)_{10} = (?)_2$

41.Perform the following conversions :

(i) $(0111)_G = (?)_{Binary}$

(ii) $(1100)_2 = (?)_{Gray}$

(iii) $(32)_{10} = (?)_{Excess\text{-}3}$

(iv) $(183)_{10} = (?)_{BCD}$.

42.Perform the following :

(i) $(28.47)_{10} = (?)_2$

(ii) $(11010.010)_2 = (?)_{10}$

(iii) $(43.4)_{10} = (?)_{16}$

(iv) $(A2.2)_{16} = (?)_{10}$

43. State various laws of Boolean algebra.

44. State and verify De Morgan's 1^{st} and 2^{nd} theorems.

45. Explain procedure for converting a logic circuit into NAND logic.

46. Explain how logic circuit can be converted to NOR logic circuit.

47. What is K-map ? Where is it used ? What are its advantages ? Explain 3 variable K-map with suitable example.

47. Draw logic symbols and truth tables for NAND, NOR, EX-OR and NOT gate.

48. Simplify following equations using laws of Boolean algebra :

(i) $Y = AB + BC + \bar{B}\,A + \bar{A}\,B$, (ii) $Y = ABCD + ABC + AB + A\bar{B}$

(iii) $Y = \bar{A} + AB + A\bar{B}$ (iv) $Y = AB + \bar{A}\,B + ABC$

49. Write a note on logic families.

50. Why NAND gate is called as universal building block ? Explain it with suitable example.

51. Use only NOR gate to build NAND, OR and EX-OR gates.

52. What are the logic families ? Give their different characteristics.

53. Design all basic gates using NOR gate.

54. Reduce the following Boolean expressions :

(i) $\overline{A \cdot (A + C)}$, (ii) $(\bar{C} + B)\,(C + B)$, (iii) $AC\bar{D} + \bar{A}\,C\bar{D}$

(iv) $\overline{A\bar{B} + ABC + A\,(B + A\bar{B})}$

55. Minimise the following expressions by using K-map :

(i) $ABC + \bar{A}\,B\bar{C} + B$, (ii) $\bar{A}\,B\bar{C}\,D + AB\bar{C}\,D + ABC\bar{D} + A\bar{B}\,C\bar{D}$

56. Draw a logic circuit and obtain truth table for following expression :

$$Y = AC\bar{D} + \bar{A}\,BC$$

57. Convert the following expressions into their standard SOP and POS forms :

(a) $Y = AB + AC + BC$

(b) $Y = (A + B)(\overline{B} + C)$

(c) $Y = A + B + C + ABC$