Sub: Digital Electronics for 4th sem EEN

Assignment 1: Number system and Coding

1. Convert into decimal (i) 1101101 (ii) 1101.11
2. Add : (i) 11011 + 1101 (ii) 1010.11 + 1101.10 + 1001.11 + 1111.11
3. Substract: (i) 1100.10 − 111.01 (ii) 10001.01 − 1111.11
4. Multiply: (i) 1101 × 101 (ii) 1101.11 × 101.1
5. Divide: (i) 11011 by 10.1 (ii) 11110 by 101
6. Represent the following decimal numbers in 8-bit: (a) Sign magnitude form (b) 1's complement form (c) 2's complement form.
(i) +27 (ii) −17 (iii) −76
7. Substract the following decimal numbers using 12-bit 2's complement arithmatic:
(i) 46 − 19 (ii) 125.3 − 46.7
8. Convert (i) Octal to Hexadecimal (a) $(256)_8$ (b) $(7.25)_8$
(ii) Hexadecimal to octal (a) $(2AB)_{16}$ (b) $(F7.A8)_{16}$
9. Convert (i) Octal to decimal (a) $(2056)_8$ (b) $(2057.64)_8$
(ii) Decimal to octal (a) 287 (b) 420.6
10. Add (i) $(173)_8 + (265)_8$ (ii) $(25.76)_8 + (16.57)_8$
11. Substract (i) $(462)_8 - (175)_8$ (ii) $(175.6)_8 - (47.7)_8$
12. Convert into ~~decimal~~ binary : (i) $(F297)_{16}$ (ii) $(AF9.BOD)_{16}$
13. Convert into hexadecimal (i) 10110 (ii) 110110011.01111
14. Convert hexadecimal to decimal : 2EB7
15. Convert decimal to hexadecimal: 4796
16. Add : EOF 3.5D + 49E6.F7
17. Substract: ~~DC5 − A2B~~ DC5 − A2B

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18. What do you understand by (i) a weighted code and non-weighted code (ii) a positively-weighted code and a negatively-weighted code?

19. Define — (i) a sequential code & give example
(ii) self-complementing code & give example
(iii) cyclic-code & give example

20. What is BCD code? What are the advantages and disadvantages of BCD code

21. What are the rules of (a) a BCD addition and subtraction and (b) XS-3 addition and subtraction.

22. What do you mean by an error-detecting and an error-correcting code? Or give examples.

23. What is Hamming code? How is the Hamming code word tested and corrected?

24. Express i) 157.5 in 8421 BCD code
ii) 8129 in XS-3 code
iii) 0110 1001 0111 . 0100 in decimal no.
iv) 1011 1000 1100

25. Add in BCD : (i) 275 + 496 (ii) 205.7 + 193.65

26. Add in XS-3 : (i) 275 + 496 (iii) 89.6 + 273.7

27. Subtract in BCD : 920 − 265

28. Subtract in XS-3 : 86 − 24

29. Convert into Gray code : (i) 96 (ii) 286 (iii) 1101010

30. Convert into Binary from Gray code : (i) 1111 (ii) 1110111

31. Identify errors for odd-parity : (i) 10010101 (ii) 11010101

32. Detect and correct errors, if any in the even parity Hamming codes : (i) 1101010 (ii) 1110111

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