



National Institute of Technology Patna

Department of Electronics and Communication Engineering Digital Design (EC-14102) Practice Sheet-3

B.Tech.: Semester-3, CSE-I and CSE-II

Session: Jul-Dec 2024

Unit: I

Topic: Number System

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PROBLEMS

- Convert the following binary numbers to decimal:
(i) 1110 (ii) 1010 (iii) 11100 (iv) 11101 (v) 11111
(vi) 110011.11 (vii) 1000001.111 (viii) 1110001.0001 (ix) 1111111.1111
- Convert the following decimal number to binary:
(i) 17 (ii) 24 (iii) 48 (iv) 186
(v) 61.32 (vi) 93.246 (vii) 10.0981
- Convert the following numbers with the indicated bases to decimal:
(i) $(4021.2)_5$ (ii) $(198)_{12}$ (iii) $(435)_8$ (iv) $(345)_6$
(v) $(DADA.B)_{16}$ (vi) $(26.24)_8$ (vii) $(11C)_{13}$
- Convert the following decimal numbers to the indicated base:
(i) $(37.625)_{10} \rightarrow ()_8$ (ii) $(254)_{10} \rightarrow ()_{16}$ (iii) $(25)_{10} \rightarrow ()_4$ (iv) $(37.625)_{10} \rightarrow ()_{16}$
- Convert the following numbers with the indicated bases to the other indicated base:
(i) $(235)_8 \rightarrow ()_2$ (ii) $(110110101.1011)_2 \rightarrow ()_8$ (iii) $(CAD)_{16} \rightarrow ()_2$
(iv) $(101011000.11)_2 \rightarrow ()_{16}$ (v) $(ECE)_{16} \rightarrow ()_8$ (vi) $(5742)_8 \rightarrow ()_{16}$
- Add the following numbers with the indicated bases:
(i) $(11101)_2 + (10111)_2$ (ii) $(1001)_2 + (101)_2$ (iii) $(564)_8 + (243)_8$
(iv) $(FACE)_{16} + (CAD)_{16}$ (v) $(A0)_{16} + (6B)_{16}$
- Perform the 1's and 2's complement of following numbers:
(i) $(101100)_2$ (ii) $(0.0110)_2$
- Express each decimal number as an 8-bit number in the 1's and 2's complement form:
(i) -34 (ii) +57 (iii) -68 (iv) -125
- Determine the decimal value of each signed number in the sign-magnitude, 1's complement, and 2's complement form:
(i) 10011001 (ii) 01110100 (iii) 10111111
- Perform the subtraction of following numbers using 9's and 10's complement:
(i) $72532 - 03250$ (ii) $3250 - 72532$
- Perform the subtraction of following numbers using 1's and 2's complement:
(i) $1010100 - 1000100$ (ii) $1000100 - 1010100$



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12. Convert the following decimal numbers to BCD:
(i) 10 (ii) 18 (iii) 57 (iv) 125 (v) 186 (vi) 359 (vii) 1051
13. Convert each of the BCD numbers to decimal:
(i) 10000000 (ii) 001101000110 (iii) 011101010100
(iv) 0001011010000011 (v) 1001000000011000
14. Add the following BCD numbers:
(i) $1000 + 0110$ (ii) $00011000 + 00010001$ (iii) $01010001 + 01011000$
(v) $010101100001 + 011100001000$
15. Convert each binary numbers to Gray code:
(i) 11011 (ii) 1001010 (iii) 1111011101110 (iv) 11000011
16. Convert each Gray code to binary:
(i) 1010 (ii) 00010 (iii) 11000010001