Assignment 1

Subject: Computer Architecture.

Unit 1

1. Define Computer architecture? Differentiate between Computer architecture and computer organization.
2. What is the need of complement? Explain r's and r-1's complement with example.
3. What is number system? Explain the different types of number system with example?
4. What is overflow? Justify with example.
5. Explain signed, 1's and 2's complement with examples.
6. Write short notes about:
    a. 2-4-2-1 code (self-Complementing Code)
    b. Excess-3 code
    c. BCD code
    d. Gray code (Reflection code)
    e. EBCDIC
    f. ASCII
    g. 8-4-2-1
7. What do you mean by error detection codes? Explain the 4 bit parity generator and 5 bit parity checker of odd parity system with desired expressions and tables.
8. Perform the arithmetic operations (+70)+ (+80) and (-70)+ (-80) with binary numbers in signed-2's complement representation. Use eight bit to accommodate with each numbers together with its sign. Show that overflow occurs in both cases, that the last two carries are unequal, and that there is a sign reversal.
9. Perform the subtraction with the following unsigned binary numbers by talking the 2's complement of the subtrahend.
    a. 11010 - 10000
    b. 100 – 110000
    c. 1010100 - 1010100
10. Write the algorithm for binary 2's complement subtraction. Also, show the examples.
11. Write the algorithm for 9's and 10's complement with examples.
12. Conversion into :
    a. 7543.34_{10} to binary
    b. 5678_{10} to octal
    c. 1975_{10} to hexadecimal
    d. $895A.4B_{16}$ to binary
    e. 1010101.111001_2 to Octal and then to Hexadecimal
13. Obtain the 9's complement of the following eight-digit decimal number:

    12349876, 00980100, 90009951, and 00000000

14. Obtain the 10’s complement of the following six-digit decimal number:

    123900; 090675; 100000; and 000000

15. Represent decimal number 8620 in BCD, Excess-3 code, 2-4-2-1 code and as a binary.
16. Write an algorithm for converting Binary to gray code and vice-versa. Also illustrate them with examples.