Third Assignment:

1. Explain the various steps involved in path testing. For the problem in Q3 generate the test cases for path testing.
2. Write a short note on data flow testing. Consider a pseudo code

```
1.    Program Commission (INPUT,OUTPUT)
2.          Dim locks, stocks, barrels As Integer
3.          Dim lockPrice, stockPrice, barrelPrice As Real
4.          Dim totalLocks, totalStocks, totalBarrels As Integer
5.          Dim lockSales, stockSales, barrelSales As Real
6.          Dim sales, commission As Real
7.          lockPrice = 45.0
8.          stockPrice = 30.0
9.          barrelPrice = 25.0
10.         totalLocks = 0
11.         totalStocks = 0
12.         totalBarrels = 0
13.         Input(locks)
14.         While NOT(locks = -1)  'loop condition uses -1 to
            indicate end of data
15.               Input(stocks, barrels)
16.               totalLocks = totalLocks + locks
17.               totalStocks = totalStocks + stocks
18.               totalBarrels = totalBarrels + barrels
19.               Input(locks)
20.         EndWhile
21.         Output("Locks sold: ", totalLocks)
22.         Output("Stocks sold: ", totalStocks)
23.         Output("Barrels sold: ", totalBarrels)
24.         lockSales = lockPrice * totalLocks
25.         stockSales = stockPrice * totalStocks
26.         barrelSales = barrelPrice * totalBarrels
27.         sales = lockSales + stockSales + barrelSales
28.         Output("Total sales: ", sales)
```

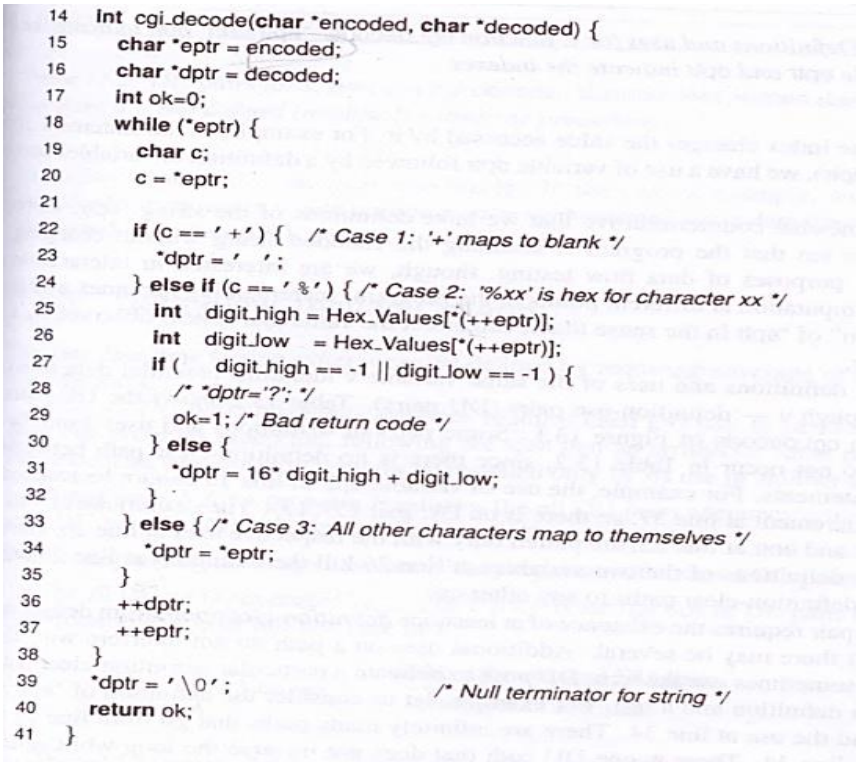
   a. Find the DEF, USE for each variable.
   b. Identify the various DU pairs for all the variables. Perform all DU path testing for the same.
3. Consider a code

```
1.    static void questionable( ){
2.        int k,i,n;
3.        input (n,k);
4.        for(i=0; i<n; i++) {
5.            if( k<0)
6.                {k=0};
7.            else { k+=i}
          }
8.    system.out.println (k); }
```

For the above code,

a. Draw a Data Flow Graph.
b. Find DEF, C-USE and P-USE for every node in the graph and list all DU pairs.

4. Explain the different coverage criteria techniques involved in Data flow testing with an example for each.
5. List the definition, usage for each node and DU pairs for the given program.



```
14  int cgi_decode(char *encoded, char *decoded) {
15    char *eptr = encoded;
16    char *dptr = decoded;
17    int ok=0;
18    while (*eptr) {
19      char c;
20      c = *eptr;
21
22      if (c == '+') {   /* Case 1: '+' maps to blank */
23        *dptr = ' ';
24      } else if (c == '%') { /* Case 2: '%xx' is hex for character xx */
25        int   digit_high = Hex_Values[*(++eptr)];
26        int   digit_low  = Hex_Values[*(++eptr)];
27        if (    digit_high == -1 || digit_low == -1 ) {
28          /* *dptr='?'; */
29          ok=1; /* Bad return code */
30        } else {
31          *dptr = 16* digit_high + digit_low;
32        }
33      } else { /* Case 3: All other characters map to themselves */
34        *dptr = *eptr;
35      }
36      ++dptr;
37      ++eptr;
38    }
39    *dptr = '\0';                    /* Null terminator for string */
40    return ok;
41  }
```