1. Design and implement CRC error detection method used in data link layer.

#include<stdio.h>

#include<stdlib.h>

main()

{

int c[50], b[50], a[17] ={1, 0, 0}

int i, j, m, n=3, q, r, x, y, z, e, pos, fail=1;

printf ("enter no of bits for messages:\n");

scanf ("%d",&m);

printf ("enter the message to be transmitted:\n");

for (i=0; i<m; i++)

{

scanf ("%d", &b[i] );

c[i] = b[i];

}

for (i=m; i<m+n-1; i++) // append n-1 zeros at the end of message

b[i] = 0;

if ( m<n )

{

printf ("error!!! enter bits again");

exit (0);

}

else

{

y=0;

for (i=0;i<m;i++)

{

if (b[y]==1)

for (x=y,j=0; x<y+n; x++, j++)

b[x] = b[x] ^ a[j];

else

for (x=y; x<y+n; x++)

b[x] = b[x] ^ 0;

y++;

}

}

for (i=m; i<m+n-1; i++)

c[i] = b[i];

printf ("message to be sent is:\n");

for (i=0; i<m+n-1; i++)

printf ("%d", c[i]);

printf ("\nintroduce error?? yes or no[1 or 0]:\n");

scanf ("%d", &e);

if (e==1)

{

printf("enter the position to be changed:");

scanf("%d",&pos);

if( pos>m)

printf ("\ninvalid position!!");

else

if( c[pos-1]==0)

c[pos-1]=1;

else

c[pos-1]=0;

}

printf ("message received at receiver site:\n");

for (i=0; i<m+n-1; i++)

printf ("%d", c[i]);

z = 0;

for (i=0; i<m; i++)

{

if (c[z]==a[0])

{

for (x=z,j=0; x<z+n; x++, j++)

c[x] = c[x] ^ a[j];

}

else

{

for (x=z; x<z+n; x++)

c[x] = c[x] ^ 0;

}

z++;

}

for (i=0; i<m+n-1; i++)

{

if (c[i]==1)

{

printf ("\n error in the message!!!\n");

fail = 0;

break;

}

}

if (fail)

printf ("\n successful transfer of message\n");

}

