

Q. write a program for error detecting code using
CRC-CCITT(16-bit)

```
#include <stdio.h>
```

```
char m[50], s[50], r[50], q[50], temp[50];
```

```
void calbeams(int);
```

```
void wrc(int);
```

```
void wllram();
```

```
void shift1();
```

```
int main()
```

```
{
```

```
int n, i = 0;
```

```
char ch, flag = 0;
```

```
printf("Enter the frame bits: ");
```

```
while ((ch gets(s)) != '\n')
```

```
m[i++] = ch;
```

```
n = i;
```

```
for (i = 0; i < 16; i++)
```

```
m[n++] = '0';
```

```
m[n] = '\0';
```

```
printf("Message after appending 16 zeros: %s", m);
```

```
for (i = 0; i < 16; i++)
```

```
s[i] = '0';
```

```
s[0] = s[4] = s[11] = s[16] = '1', s[17] = '\0';
```

```
printf("\n generator: %s\n", s);
```

```
crc(n);
```

```
printf("\n quotient: %s\n", s);
```

```
caltrans(n);
```

```
printf("\n transmitted frame: %s", m);
```

```
printf("Enter transmitted frame: ");
```

```
scanf("%s", m);
```

```
crc(m);
```

```
printf("\n last remainder: %s", r);
```

```
for (i = 0; i < 16; i++)
```

```
if (r[i] != '0')
```

```
flag = 1;
```

```
else
```

```
continue;
```

```
if (flag = 1)
```

```
printf("Error during transmission");
```

```
else
```

```
printf("\n Received frame is correct");
```

```
{
```

```
void crc (int n)
```

```
{
```

```
int i, j;
```

```
for (i = 0; i < n; i++)
```

```
len p[i] = m[i];
```

②

```

for (i=0; i<16; i++)
    r[i] = m[i];
printf ("1n intermediate remainder 1n");
for (i=0; i<n-16; i++)
{
    if (r[0] == '1')
    {
        q[i] = '1';
        calbram(i);
    }
    else
    {
        q[i] = '0';
        shift 1(i);
    }
    r[16] = m[17+i];
    r[17] = ('0');
}
printf ("1n remainder % d: % s", i+1, r);

for (j=0; j<=17; j++)
    temp[j] = r[j];
{
    q[n-16] = ('0');
}
void calbram(i)
{
    int i, j;
    for (i=17; i<=16; i++)

```

```
8 = [i-1] = ((int) temp [i] - 48) ^ ((int) s [i] - 48) + 48;
```

```
}
```

```
void shift 1()
```

```
{  
  int i;
```

```
  int i;
```

```
  for (i=1; i<=16; i++)
```

```
    s[i-1] = s[i];
```

```
}
```

```
void caltrans (int n)
```

```
{  
  int i, k=0;
```

```
  for (i=n-16; i<n; i++)
```

```
    m[i] = ((int) m[i] - 48) ^ ((int) s[k++] - 48) + 48;
```

```
  m[i] = '10';
```

```
}
```