Experiment. 10

```
% Convolution Encoder
  x=input('Enter number of outputs:');
  f=input('Enter number of flip flops:');

  %Define the trellis structure
 trellis=struct('numInputSymbols',2,'numOutputSymbols',4,...
     'numStates',4,'nextStates',[0 2;2 3;3 1;1 3],...
     'outputs',[0 3;3 0;2 1;1 2]);

%input the message
n=input('enter number of message bits:');
msg=zeros(1,n);
for i=1:n
    msg(i)=input('enter message bits:');

end

%perform the convolution encoding
code=convenc(msg,trellis);

%display the convolution code
fprintf('the convolution code is:\n');
for i=1:length(code)
    fprintf('%d',code(i));
end
fprintf('\n');
```

OUTPUT:

Enter number of outputs:5

Enter number of flip flops:3

enter number of message bits:5

enter message bits:1

enter message bits:0

enter message bits:1

enter message bits:1

enter message bits:0

the convolution code is:

1110101001

```
% Convolution Decoder

  x=input('Enter number of outputs:');
  f=input('Enter number of flip flops:');

  %Define the trellis structure
 trellis=struct('numInputSymbols',2,'numOutputSymbols',4,...
     'numStates',4,'nextStates',[0 2;2 3;3 1;1 3],...
     'outputs',[0 3;3 0;2 1;1 2]);

%input the message
n=input('enter number of message bits:');
msg=zeros(1,n);
for i=1:n
    msg(i)=input('enter message bits:');

end

%perform the convolution encoding
code=convenc(msg,trellis);

%display the convolution code
fprintf('the convolution code is:\n');
for i=1:length(code)
    fprintf('%d',code(i));
end
fprintf('\n');

%Viterbi decoding of the convolution code
decoded=vitdec(code,trellis,n,'trunc','hard');

%Display the decoded message
fprintf('The Decoded message is:\n');
for m=1:n
    fprintf('%d',decoded(m));
end
fprintf('\n');
```

OUTPUT:

Enter number of outputs:5

Enter number of flip flops:3

enter number of message bits:5

enter message bits:1

enter message bits:0

enter message bits:1

enter message bits:1

enter message bits:0

the convolution code is:

1110101001

The Decoded message is:

10110