DC AHP-4

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SRN: PES1UG21EC071

Semester:4th

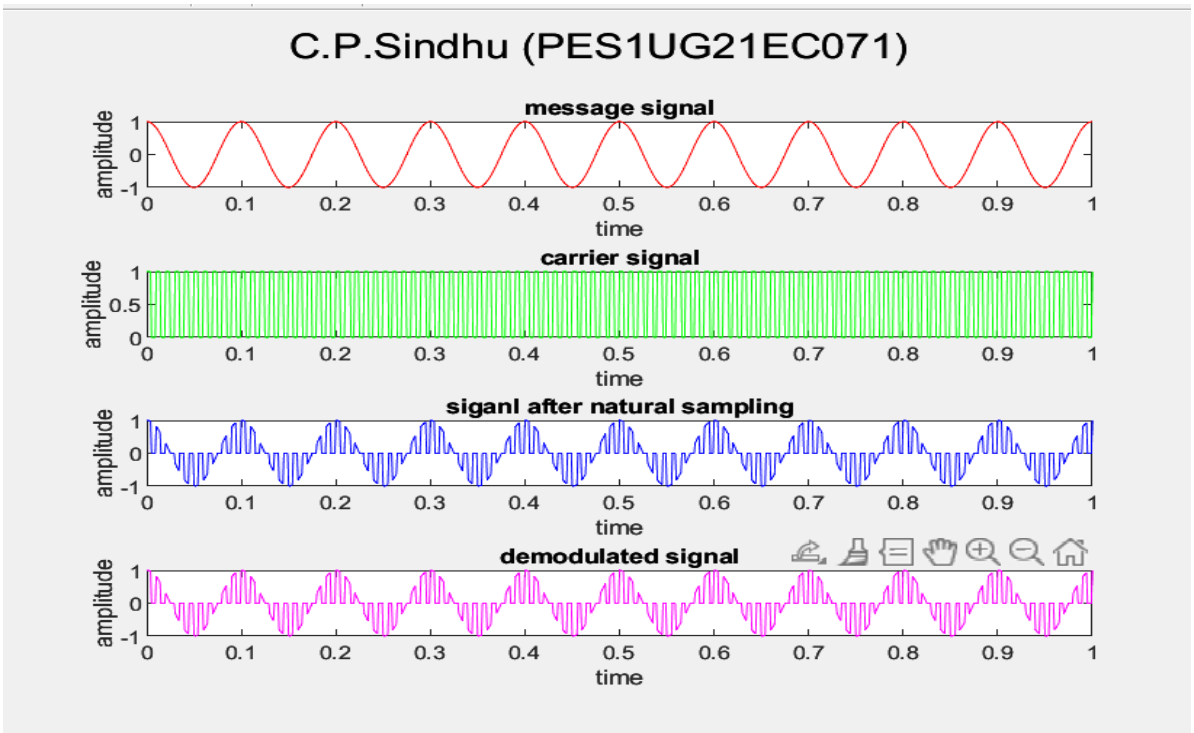
Section: 'B'

A) Natural Sampling

CODE:

```
clc;
clear all;
close all;
fm=1e1;
fc=1e2;
t=0:0.001:1;
fs=1000;
m=cos(2*pi*fm*t);
c=0.5*square(2*pi*fc*t)+0.5;
s=m.*c;
dt=s.*c;
filter=fir1(20,fm/fs,'low');
d=conv(filter,dt);
l=length(d);
t1=linspace(0,1,1);

subplot(411);
sgtitle("C.P.Sindhu (PES1UG21EC071)")
plot(t,m,'r');
xlabel('time');
ylabel('amplitude');
title('message signal');

subplot(412);
plot(t,c,'g');
xlabel('time');
ylabel('amplitude');
title('carrier signal');

subplot(413);
plot(t,s,'b');
xlabel('time');
ylabel('amplitude');
title('siganl after natural sampling');

subplot(414);
plot(t,dt,'m');
xlabel('time');
ylabel('amplitude');
title('demodulated signal');
```

Output:



B)Flat Top Sampling

CODE:

```
clc;
close all;
clear all;
fm=1e1;
fc=1e2;
t=1;
fs=1000;
n=[0:1/fs:t-1/fs];
m=cos(2*pi*fm*n);
duty=20;
s=0.5*square(2*pi*fc*n,duty)+0.5;
period_samp=length(n)/fc;
in=[1:period_samp:length(n)];
on_samp=ceil(period_samp*duty/100);
pam=zeros(1,length(n));
for i =1:length(in)
    pam(in(i):in(i)+on_samp)=m(in(i));
end
dt=s.*pam;
filter=fir1(20,fm/fs,'low');
d=conv(filter,dt);
l=length(d);
t1=linspace(0,1,l);
subplot(411)
plot(n,m,'r');
title('Message signal');
xlabel('time');
ylabel('amplitude');
subplot(412);
plot(n,s,'g');
```

```
title('carrier signal');
xlabel('time');
ylabel('amplitude');
subplot(413);
plot(n,pam,'b');
title('signal after flat top (PAM) sampling');
xlabel('time');
ylabel('amplitude');
subplot(414);
plot(t1,d,'m');
title('demodulated signal');
xlabel('time');
ylabel('amplitude');
```

Output: