

```

1 %-----%
2 % Mete Can GAZI - 141024020 %
3 %-----%
4 clc
5 clear
6
7 %PARAMETERS%
8 fs = 10^6;           %Sample Rate
9 fc = 200;            %Freq. of Carrier
10 fm = 10;            %Freq. of Message
11 Kf = 100;           %Freq. Sensivity
12 A = 0.05;           %Amp. of Message
13
14 %CALCULATIONS%
15 BetaKf = (A*Kf)/fm;
16 t = (0:fs-1)*(1/fs);
17 s = cos((2*pi*fc*t)+(BetaKf*sin(2*pi*fm*t)));
18 fftsignal = fftshift(fft(s))/fs;
19 f = (-fs/2:fs/2-1);
20
21 n=5;
22 bessel = (1/2)*besselj(0:n,BetaKf);
23 C_Bessel = zeros(1,(2*n+1));
24
25 holder_1 = 1;
26 for i=(n+1):(2*n+1)
27     C_Bessel(i) = bessel(holder_1);
28     holder_1 = holder_1 + 1;
29 end
30
31 holder_2 = n+1;
32 for j=1:(n)
33     C_Bessel(j) = bessel(holder_2);
34     holder_2 = holder_2 - 1;
35 end
36
37 C_Freq = (fc-n*fm):fm:(fc+n*fm);
38
39 %GRAPHS%
40 figure;
41 plot(t,s);
42 axis([0 0.1 -1.5 1.5]);
43 title('FM Signal for A = 0.05 , Kf = 100');
44 grid on;
45
46 figure;
47 plot(f,abs(fftsignal));
48 axis([-2*fc 2*fc 0 0.55]);
49 title('Spectrum for A = 0.05 , Kf = 100');
50 grid on;
51
52 figure;
53 plot(f,abs(fftsignal),C_Freq , C_Bessel, 'o');
54 axis([0 2*fc -0.1 0.55]);
55 title('Spectrum Points for A = 0.05 , Kf = 100');
56 grid on;

```

