No. of the experiment: 08

Name of the experiment: To find the amplitude spectrum of the two frequency signal: $x(t) = 4\cos(2\pi 100t) + \cos(2\pi 500t)$ and also find approximate the Fourier ~~Fourtra~~ transform form integral for $0 \leq f \leq 800$ Hz.

Theory:

Amplitude spectrum: The amplitude spectrum is a simple transformation of the DFT. The amplitude spectrum is the vector that containing the absolute values of the co-efficients of the frequency-domain representation of x. It shows which frequencies contribute more to the magnitude of x.

Fourier Transform Integral: The Fourier Transform uses an integral (or, 'continuous sum') that exploit properties of sine and cosine to recover the amplitude and phase of each sinusoids in a Fourier series.

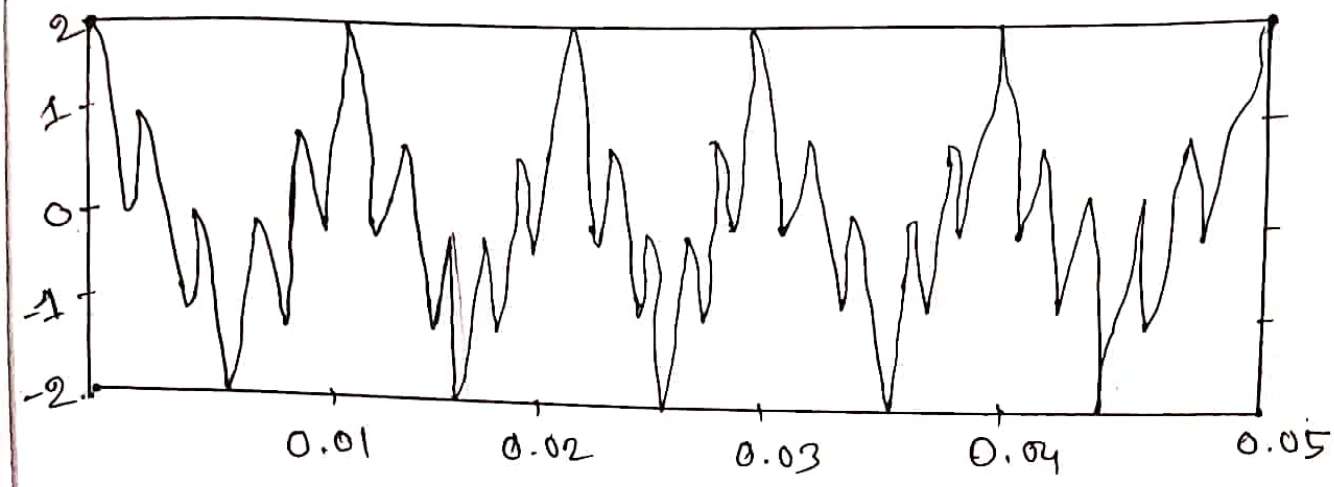
~~Output~~: Matlab code:

```
clc;
clear all;
close all;
N = 250;
ts = 0.0002;
t = [0 : N-1] * ts;
x = cos(2*pi*100*t) + cos(2*pi*500*t);
subplot(2,1,1);
plot(t,x);

k=0;
for f=0:1:800
    k=k+1;
    X(k) = trapz(t, x.*exp(-j*2*pi*f*t));
end

f = 0:800;
subplot(2,1,2);
plot(f, abs(X));
```

Output: $x(t) = \cos(2\pi 100t) + \cos(2\pi 500t)$



Fourier transform integral ($0 \leq f \leq 800$)