

EE 202 - Mathematical Techniques in Electrical Engineering

LAB 3

**** Find solutions of the following questions in Matlab:**

Question 1:

Construct trigonometric polynomial interpolation of degree 2 to $f(t) = e^{\sin t + \cos t}$ on $[0, 2\pi]$.

```
n=2;
t=0:0.001:10;
% ck=zeros(1,2*n+1);
k=[-2 -1 0 1 2];
sum1=zeros(1,2*n+1);sum2=zeros(1,length(t));
for j=0:2*n
tj=((2*pi)/(2*n))*j;
fj=exp((sin(tj))+cos(tj));
sum1=sum1+(1/((2*n)+1))*(exp(-i*k*tj)*fj);
end
a0=sum1(1,3);
a1=sum1(1,4)+sum1(1,2);
a2=sum1(1,5)+sum1(1,1);
A=[a1 a2];
b0=0;
b1=i*(sum1(1,4)-sum(1,2));
b2=i*(sum1(1,5)-sum(1,1));
B=[b1 b2];
for j=1:n
sum2=sum2+((A(j))*cos(j*t))+((B(j))*sin(j*t));
end
pn=a0+sum2;
fn=exp((sin(t))+cos(t));
plot(t,pn)
hold on
plot(t,fn,'r')
```