

LAMPIRAN

Lampiran 1. Program Matlab untuk Mencari Koefisien Deret Fourier dan Faktor Daya Metode kendali Sudut Penyalaan Beban Bersifat Resistif.

```

L=0;
R=100;
f=50;
w=2*pi*f;
t=w*L;
vm=311;
nilaialpa=0/180*pi

syms x ;
p=10
for n=1:p;

    T=2*pi;
    alpa=nilaialpa;
    alpa2=pi+nilaialpa
    sudut1=pi;
    sudut2=2*pi;
    an0=int(sin(x)*(cos(n*x)),alpa,sudut1)+int(sin(x)*(cos(n*x)),alpa2,sudut2);
    an=2*(vm*an0)/T;
    anmatrik(n)=an

    T=2*pi;
    alpa=nilaialpa;
    alpa2=pi+nilaialpa
    sudut1=pi;
    sudut2=2*pi;
    bn0=int(sin(x)*(sin(n*x)),alpa,sudut1)+int(sin(x)*(sin(n*x)),alpa2,sudut2);
    bn=(vm*bn0)*2/T;
    bnmatrik(n)=bn

    beban(n)=R+t*i*n;
    vn(n)=(1/(2^0.5))*((anmatrik(n)^2+bnmatrik(n)^2)^0.5);
    lnkompleks(n)=vn(n)/beban(n)
    ln(n)=abs(lnkompleks(n))
    teta(n)=atan(anmatrik(n)/bnmatrik(n))
    lnkuadrat(n)=ln(n)^2

end
faktorgeser=cos(teta(1))
teta1derajat=(teta(1)/3.14)*180
ldistorsi=(sum(lnkuadrat(2:p)))^0.5
istotal=(sum(lnkuadrat(1:p)))^0.5
THD=100*(ldistorsi/ln(1))
faktordistorsi=(ln(1)/istotal)
faktordaya=faktordistorsi*faktorgeser

```

Lampiran 2. Program Matlab untuk Mencari Koefisien Deret Fourier dan Faktor Daya Metode kendali Sudut Penyalan Beban Bersifat Induktif.

```

L=0.1;R=100;f=50;
w=2*pi*f;
t=w*L;
nilaialpa=90/180*pi
taulnv=R/(w*L)
peakV=311
X=w*L;
if (X<0.001) X=0.001; end;
Z=sqrt(R*R+X*X);
taulnv=R/(w*L)
loadAng=atan(X/R)
vm=(peakV/Z);
A=(peakV/Z)*(((sin(pi-loadAng))*exp(-(nilaialpa*taulnv)))-sin(nilaialpa-loadAng))/(1.0-exp(-
(pi*taulnv)))

syms x

p=10
for n=1:p;

    T=2*pi;
    alpa=nilaialpa;
    sudut1=pi;
    an0=int(vm*sin(x-loadAng)*(cos(n*x)),alpa,sudut1)+int((A*exp(-(x-
    nilaialpa)*(taulnv)))*(cos(n*x)),alpa,sudut1)+int(vm*sin(x-
    loadAng)*(cos(n*x)),alpa+3.14,6.28)+int((-A*exp(-(x-nilaialpa-
    pi)*(taulnv)))*(cos(n*x)),alpa+3.14,6.28)
    an=2*(an0)/T;
    anmatrik(n)=an

    T=2*pi;
    alpa2=nilaialpa;
    sudut2=pi;
    bn0=int(vm*sin(x-loadAng)*(sin(n*x)),alpa2,sudut2)+int((A*exp(-(x-
    nilaialpa)*(taulnv)))*(sin(n*x)),alpa2,sudut2)+int(vm*sin(x-
    loadAng)*(sin(n*x)),alpa+3.14,6.28)+int((-A*exp(-(x-nilaialpa-
    pi)*(taulnv)))*(sin(n*x)),alpa2+3.14,6.28)
    bn=2*(bn0)/T;
    bnmatrik(n)=bn

    ln(n)=(1/(2^0.5))*((anmatrik(n)^2+bnmatrik(n)^2)^0.5);
    lnkuadrat(n)=ln(n)^2
    teta(n)=atan(anmatrik(n)/bnmatrik(n))

end
faktorgeser=cos(teta(1))
teta1derajat=(teta(1)/3.14)*180
ldistorsi=(sum(lnkuadrat(2:p)))^0.5
istotal=(sum(lnkuadrat(1:p)))^0.5
THD=100*(ldistorsi/ln(1))
faktordistorsi=(ln(1)/istotal)
faktordaya=faktordistorsi*faktorgeser

```

Lampiran 3. Program Matlab untuk Mencari Koefisien Deret Fourier dan Faktor Daya Metode Kendali Modulasi Lebar Pulsa Beban Bersifat Resistif.

```

persenvdc=0.2
R=100;frekuensi=50;w=2*pi*frekuensi;t=w*L;vm=311;nilaim=4;
deltam=(((0.5/frekuensi)/nilaim)*persenvdc)*2*pi*frekuensi
alpa=(((0.5/frekuensi)/nilaim)-((0.5/frekuensi)/nilaim)*persenvdc)/2)*2*pi*frekuensi

syms x ;
p=10
for h=1:nilaim;
    sudut2(h)=h*alpa+h*deltam+(h-1)*alpa
    sudut1(h)=sudut2(h)-(h-(h-1))*deltam
    sudut4(h)=(pi)+h*alpa+h*deltam+(h-1)*alpa
    sudut3(h)=sudut4(h)-(h-(h-1))*deltam
end

for n=1:p;
    an01=0
    bn01=0
    an02=0
    bn02=0
    for h=1:nilaim;

        an0=int(sin(x)*(cos(n*x)),sudut1(h),sudut2(h))
        an01=an01+an0
        %% an1=int(sin(x)*(cos(n*x)),sudut3(h),sudut4(h))
        % an02=an02+an1
        ann=an01+an02
        bn0=int(sin(x)*(sin(n*x)),sudut1(h),sudut2(h))
        bn01=bn01+bn0
        % bn1=int(sin(x)*(sin(n*x)),sudut3(h),sudut4(h))
        % bn02=bn02+bn1
        bnn=bn01+bn02
    end
    T=2*pi;
    an=2*(vm*ann)/T;
    anmatrik(n)=an
    bn=2*(vm*bnn)/T;
    bnmatrik(n)=bn

    beban(n)=R+t*i*n;
    vn(n)=((anmatrik(n)^2+bnmatrik(n)^2)^0.5)/(2^0.5);
    Inkompleks(n)=vn(n)/beban(n)
    ln(n)=abs(Inkompleks(n))
    teta(n)=atan(anmatrik(n)/bnmatrik(n))
    lnkuadrat(n)=ln(n)^2

end

faktorgeser=cos(teta(1))
teta1derajat=(teta(1)/3.14)*180
ldistorsi=(sum(lnkuadrat(2:p)))^0.5
istotal=(sum(lnkuadrat(1:p)))^0.5

```

$THD=100*(I_{distorsi}/I_n(1))$
 $faktordistorsi=(I_n(1)/I_{total})$
 $faktordaya=faktordistorsi*faktorgeser$

Lampiran 4. Program Matlab untuk Mencari Koefisien Deret Fourier dan Faktor Daya Metode Kendali Modulasi Lebar Pulsa Beban Bersifat Induktif.

```

persenvdc=1
frekuensi=50;
w=2*pi*frekuensi;
vm=311;
nilaim=4;
deltam=(((0.5/frekuensi)/nilaim)*persenvdc))*2*pi*frekuensi
alpa=(((0.5/frekuensi)/nilaim)-(((0.5/frekuensi)/nilaim)*persenvdc))/2))*2*pi*frekuensi

```

```

syms x ;
p=10
for h=1:nilaim;
    sudut2(h)=h*alpa+h*deltam+(h-1)*alpa
    sudut1(h)=sudut2(h)-(h-(h-1))*deltam
    sudut4(h)=(pi)+h*alpa+h*deltam+(h-1)*alpa
    sudut3(h)=sudut4(h)-(h-(h-1))*deltam
end

```

```

L=0.05;
R=100;
f=50;
w=2*pi*f;
t=w*L;
taulnv=R/(w*L)
peakV=311
X=w*L;
if (X<0.001) X=0.001; end;
Z=sqrt(R*R+X*X);
taulnv=R/(w*L)
loadAng=atan(X/R)
vm=(peakV/Z);

```

```
nilaim=4
```

```

sudut1=[0    0.7854  1.5708  2.3562]
sudut2=[0.7854    1.5708  2.3562  3.1416]
sudutm=[0    0.7854  1.5708  2.3562]

```

```

sudut3=sudut1+pi
sudut4=sudut2+pi
sudutm2=sudutm+pi

```

```

syms x ;
p=10
for n=1:p;
    an01=0
    bn01=0
    an02=0
    bn02=0

```



```

for h=1:nilaim
    h
    % IF(h)=vm*(sin(sudutm(h)-loadAng))
    % arussisa=[IF(1) IF(2) IF(3) IF(4)]
    % ln(h)=arussisa(h)-IF(h)

    % arussisa2=-arussisa
    % IF2(h)=vm*(sin(sudutm2(h)-loadAng))
    % ln2(h)=arussisa2(h)-IF2(h)

    an0=int((vm*(sin(x-loadAng)))*(cos(n*x)),sudut1(h),sudut2(h))%+int(((ln(h)*exp(-(x-
(sudutm(h)))*(tauInv))))*(cos(n*x)),sudut1(h),sudut2(h))
    an01=an01+an0
    an1=int((vm*(sin(x-loadAng)))*(cos(n*x)),sudut3(h),sudut4(h))%+int(((ln2(h)*exp(-(x-
(sudutm2(h)))*(tauInv))))*(cos(n*x)),sudut3(h),sudut4(h))
    an02=an02+an1
    ann=an01+an02

    bn0=int((vm*(sin(x-loadAng)))*(sin(n*x)),sudut1(h),sudut2(h))%+int(((ln(h)*exp(-(x-
(sudutm(h)))*(tauInv))))*(sin(n*x)),sudut1(h),sudut2(h))
    bn01=bn01+bn0
    bn1=int((vm*(sin(x-loadAng)))*(sin(n*x)),sudut3(h),sudut4(h))%+int(((ln2(h)*exp(-(x-
(sudutm2(h)))*(tauInv))))*(sin(n*x)),sudut3(h),sudut4(h))
    bn02=bn02+bn1
    bnn=bn01+bn02

end
T=2*pi;
an=2*(ann)/T;
anmatrik(n)=an
bn=2*(bnn)/T;
bnmatrik(n)=bn

end

p=10
for n=1:p

a=anmat(n)^2
b=bnmat(n)^2
c=(a+b)
d=(c^0.5)
e=(1/(2^0.5))*d
ln(n)=e
    Inkuadrat(n)=ln(n)^2
    teta(n)=atan(anmatrik(n)/bnmatrik(n))

end
faktorgeser=cos(teta(1))
teta1derajat=(teta(1)/3.14)*180
ldistorsi=(sum(Inkuadrat(2:p)))^0.5
istotal=(sum(lnkuadrat(1:p)))^0.5
THD=100*(ldistorsi/ln(1))
faktordistorsi=(ln(1)/istotal)
faktordaya=faktordistorsi*faktorgeser

```

