LE 200 Assignment

Laplace Transform 1, (a,e)

1-1. Find the Laplace transform of $f(t)$, then solve the ODE.

1-2. Find the unit impulse response of the system specified by the ODE, then find the system output when the input is given by $f(t)$.

Fourier Transform 1, (a,e)

2-1. Find the Fourier series of $f(x)$ (or $f(t)$), then find the "steady-state" solution for the ODE.

2-2. Find the Fourier transform of $f(x)$ assuming that $p\to\infty$, i.e., consists of only one period.

Complex variables

3-1. Find the roots of $z^5+32=0$.

3-2. Find the image of $x=1$, $y=1$ in w-plane and $u=1$, $v=1$ in z-plane for $f(z) = z^{-1}$.

3-3. Use Cauchy-Riemann equations to show that $f(z) = z \sinh z$ is analytic and verify that its derivative is given by $f'(z) = u_x + jv_x$.

3-4. Use the Green's theorem to prove the Cauchy's integral theorem.

3-5. Find the Taylor's series of $f(z) = z \sinh z$ about $z=0$.

3-6. Find the Laurent's series about all poles of $f(z) = \dfrac{1}{z^2+4z+3}$.

3-7. Consider $f(z)$ in 3-6, evaluate $\oint_C f(z)dz$ for C:$|z+1|=1$.

3-8. Evaluate the improper integral $\int_0^\infty \dfrac{dx}{1+x^4}$.

3-9. Find the inverse Laplace transform required in 1-1 by evaluating Bromwich integral.

3-10. Find the partial fraction of $\dfrac{15x+9}{x^3-9x}$.

LE 200 Assignment

Laplace Transform 2, (b,e)

1-1. Find the Laplace transform of $f(t)$, then solve the ODE.

1-2. Find the unit impulse response of the system specified by the ODE, then find the system output when the input is given by $f(t)$.

Fourier Transform 2, (b,e)

2-1. Find the Fourier series of $f(x)$ (or $f(t)$), then find the "steady-state" solution for the ODE.

2-2. Find the Fourier transform of $f(x)$ assuming that $p\to\infty$, i.e., consists of only one period.

Complex variables

3-1. Find the roots of $z^4+16=0$.

3-2. Find the image of $x=1$, $y=1$ in w-plane and $u=1$, $v=1$ in z-plane for $f(z) = (z+1)^{-1}$.

3-3. Use Cauchy-Riemann equations to show that $f(z) = z \cosh z$ is analytic and verify that its derivative is given by $f'(z) = u_x + jv_x$.

3-4. Use the Green's theorem to prove the Cauchy's integral theorem.

3-5. Find the Taylor's series of $f(z) = z \cosh z$ about $z=0$.

3-6. Find the Laurent's series about all poles of $f(z) = \dfrac{z}{z^2+4z+3}$.

3-7. Consider $f(z)$ in 3-6, evaluate $\oint_C f(z)dz$ for C:$|z+1|=1$.

3-8. Evaluate the improper integral $\displaystyle\int_0^\infty \frac{x^2dx}{2+3x^2+x^4}$.

3-9. Find the inverse Laplace transform required in 1-1 by evaluating Bromwich integral.

3-10. Find the partial fraction of $\dfrac{5x^2+2x+4}{x^3-6x^2+11x-6}$.

LE 200 Assignment

Laplace Transform 4, (c,e)

1-1. Find the Laplace transform of $f(t)$, then solve the ODE.

1-2. Find the unit impulse response of the system specified by the ODE, then find the system output when the input is given by $f(t)$.

Fourier Transform 3, (c,f)

2-1. Find the Fourier series of $f(x)$ (or $f(t)$), then find the "steady-state" solution for the ODE.

2-2. Find the Fourier transform of $f(x)$ assuming that $p\to\infty$, i.e., consists of only one period.

Complex variables

3-1. Find the roots of $z^6+27=0$.

3-2. Find the image of $x=1$, $y=1$ in w-plane and $u=1$, $v=1$ in z-plane for $f(z) = (z-1)(z+1)^{-1}$.

3-3. Use Cauchy-Riemann equations to show that $f(z) = z \sin z$ is analytic and verify that its derivative is given by $f'(z) = u_x + jv_x$.

3-4. Use the Green's theorem to prove the Cauchy's integral theorem.

3-5. Find the Taylor's series of $f(z) = z \sin z$ about $z=0$.

3-6. Find the Laurent's series about all poles of $f(z) = \dfrac{z^2}{z^2+4z+3}$.

3-7. Consider $f(z)$ in 3-6, evaluate $\oint_C f(z)dz$ for C:$|z+3|=1$.

3-8. Evaluate the improper integral $\int_0^\infty \dfrac{x^2dx}{5+6x^2+x^4}$.

3-9. Find the inverse Laplace transform required in 1-1 by evaluating Bromwich integral.

3-10. Find the partial fraction of $\dfrac{5x^2+3x+9}{x^3+4x^2+4x}$.

LE 200 Assignment

Laplace Transform 5, (d,f)

1-1. Find the Laplace transform of $f(t)$, then solve the ODE.

1-2. Find the unit impulse response of the system specified by the ODE, then find the system output when the input is given by $f(t)$.

Fourier Transform 4, (d,f)

2-1. Find the Fourier series of $f(x)$ (or $f(t)$), then find the "steady-state" solution for the ODE.

2-2. Find the Fourier transform of $f(x)$ assuming that $p \to \infty$, i.e., consists of only one period.

Complex variables

3-1. Find the roots of $z^6+8=0$.

3-2. Find the image of $x=2$, $y=1$ in w-plane and $u=2$, $v=1$ in z-plane for $f(z) = (z+1)(z-1)^{-1}$.

3-3. Use Cauchy-Riemann equations to show that $f(z) = ze^z$ is analytic and verify that its derivative is given by $f'(z) = u_x + jv_x$.

3-4. Use the Green's theorem to prove the Cauchy's integral theorem.

3-5. Find the Taylor's series of $f(z) = ze^z$ about $z=0$.

3-6. Find the Laurent's series about all poles of $f(z) = \dfrac{1}{z^3+2z^2+z}$.

3-7. Consider $f(z)$ in 3-6, evaluate $\oint_C f(z)dz$ for C:|z|=2.

3-8. Evaluate the improper integral $\displaystyle\int_0^\infty \frac{dx}{6+5x^2+x^4}$.

3-9. Find the inverse Laplace transform required in 1-1 by evaluating Bromwich integral.

3-10. Find the partial fraction of $\dfrac{4x^2+2x+7}{x^3+4x^2+4x}$.

LE 200 Assignment

Laplace Transform 6, (a,f)

1-1. Find the Laplace transform of $f(t)$, then solve the ODE.

1-2. Find the unit impulse response of the system specified by the ODE, then find the system output when the input is given by $f(t)$.

Fourier Transform 5, (a,g)

2-1. Find the Fourier series of $f(x)$ (or $f(t)$), then find the "steady-state" solution for the ODE.

2-2. Find the Fourier transform of $f(x)$ assuming that $p \to \infty$, i.e., consists of only one period.

Complex variables

3-1. Find the roots of $z^4+4=0$.

3-2. Find the image of $x=1$, $y=1$ in w-plane and $u=1$, $v=1$ in z-plane for $f(z) = (2z-1)(z+1)^{-1}$.

3-3. Use Cauchy-Riemann equations to show that $f(z) = ze^{-z}$ is analytic and verify that its derivative is given by $f'(z) = u_x + jv_x$.

3-4. Use the Green's theorem to prove the Cauchy's integral theorem.

3-5. Find the Taylor's series of $f(z) = ze^{-z}$ about $z=0$.

3-6. Find the Laurent's series about all poles of $f(z) = \dfrac{z+3}{z^3+2z^2+z}$.

3-7. Consider $f(z)$ in 3-6, evaluate $\oint_C f(z)dz$ for C:$|z|=0.5$.

3-8. Evaluate the improper integral $\int_0^\infty \dfrac{x^2 dx}{x^4+16}$.

3-9. Find the inverse Laplace transform required in 1-1 by evaluating Bromwich integral.

3-10. Find the partial fraction of $\dfrac{x^2+2x+3}{x^3+x^2-x-1}$.

LE 200 Assignment

Laplace Transform 1, (b,f)

1-1. Find the Laplace transform of $f(t)$, then solve the ODE.

1-2. Find the unit impulse response of the system specified by the ODE, then find the system output when the input is given by $f(t)$.

Fourier Transform 6, (b,g)

2-1. Find the Fourier series of $f(x)$ (or $f(t)$), then find the "steady-state" solution for the ODE.

2-2. Find the Fourier transform of $f(x)$ assuming that $p \to \infty$, i.e., consists of only one period.

Complex variables

3-1. Find the roots of $z^6+64=0$.

3-2. Find the image of $x=1$, $y=1$ in w-plane and $u=1$, $v=1$ in z-plane for $f(z) = (z+2)^{-1}$.

3-3. Use Cauchy-Riemann equations to show that $f(z) = z \cos z$ is analytic and verify that its derivative is given by $f'(z) = u_x + jv_x$.

3-4. Use the Green's theorem to prove the Cauchy's integral theorem.

3-5. Find the Taylor's series of $f(z) = z \cos z$ about $z=0$.

3-6. Find the Laurent's series about all poles of $f(z) = \dfrac{1}{z^2+5z+4}$.

3-7. Consider $f(z)$ in 3-6, evaluate $\oint_C f(z)dz$ for $C:|z+4|=2$.

3-8. Evaluate the improper integral $\int_0^\infty \dfrac{x^2 dx}{1+x^6}$.

3-9. Find the inverse Laplace transform required in 1-1 by evaluating Bromwich integral.

3-10. Find the partial fraction of $\dfrac{2x^2+3x+2}{x^3+x^2-x-1}$.

LE 200 Assignment

Laplace Transform 2, (c,g)

1-1. Find the Laplace transform of $f(t)$, then solve the ODE.

1-2. Find the unit impulse response of the system specified by the ODE, then find the system output when the input is given by $f(t)$.

Fourier Transform 7, (c,h)

2-1. Find the Fourier series of $f(x)$ (or $f(t)$), then find the "steady-state" solution for the ODE.

2-2. Find the Fourier transform of $f(x)$ assuming that $p\to\infty$, i.e., consists of only one period.

Complex variables

3-1. Find the roots of $z^8+16=0$.

3-2. Find the image of $x=1$, $y=1$ in w-plane and $u=1$, $v=1$ in z-plane for $f(z) = (z+1)^{-1}$.

3-3. Use Cauchy-Riemann equations to show that $f(z) = e^{z^2}$ is analytic and verify that its derivative is given by $f'(z) = u_x + jv_x$.

3-4. Use the Green's theorem to prove the Cauchy's integral theorem.

3-5. Find the Taylor's series of $f(z) = e^{z^2}$ about $z=0$.

3-6. Find the Laurent's series about all poles of $f(z) = \dfrac{z}{z^2+5z+4}$.

3-7. Consider $f(z)$ in 3-6, evaluate $\oint_C f(z)dz$ for C:$|z+1|=1$.

3-8. Evaluate the improper integral $\int_0^\infty \dfrac{dx}{(1+x^2)^2}$.

3-9. Find the inverse Laplace transform required in 1-1 by evaluating Bromwich integral.

3-10. Find the partial fraction of $\dfrac{x^2+2x+3}{x^3-5x^2+8x-4}$.

LE 200 Assignment

Laplace Transform 4, (d,g)

1-1. Find the Laplace transform of $f(t)$, then solve the ODE.

1-2. Find the unit impulse response of the system specified by the ODE, then find the system output when the input is given by $f(t)$.

Fourier Transform 1, (d,h)

2-1. Find the Fourier series of $f(x)$ (or $f(t)$), then find the "steady-state" solution for the ODE.

2-2. Find the Fourier transform of $f(x)$ assuming that $p\to\infty$, i.e., consists of only one period.

Complex variables

3-1. Find the roots of z^5-32=0.

3-2. Find the image of x=1, y=1 in w-plane and u=1, v=1 in z-plane for $f(z) = (z-1)(z+1)^{-1}$.

3-3. Use Cauchy-Riemann equations to show that $f(z) = e^{-z^2}$ is analytic and verify that its derivative is given by $f'(z) = u_x + jv_x$.

3-4. Use the Green's theorem to prove the Cauchy's integral theorem.

3-5. Find the Taylor's series of $f(z) = e^{-z^2}$ about z=0.

3-6. Find the Laurent's series about all poles of $f(z) = \dfrac{(z+1)^2}{z^2+5z}$.

3-7. Consider $f(z)$ in 3-6, evaluate $\oint_C f(z)dz$ for C:|z|=1.

3-8. Evaluate the improper integral $\displaystyle\int_0^\infty \frac{dx}{2+3x^2+x^4}$.

3-9. Find the inverse Laplace transform required in 1-1 by evaluating Bromwich integral.

3-10. Find the partial fraction of $\dfrac{x^2+4x+5}{x^3-5x^2+8x-4}$.

LE 200 Assignment

Laplace Transform 5, (a,h)

1-1. Find the Laplace transform of $f(t)$, then solve the ODE.

1-2. Find the unit impulse response of the system specified by the ODE, then find the system output when the input is given by $f(t)$.

Fourier Transform 2, (a,i)

2-1. Find the Fourier series of $f(x)$ (or $f(t)$), then find the "steady-state" solution for the ODE.

2-2. Find the Fourier transform of $f(x)$ assuming that $p\to\infty$, i.e., consists of only one period.

Complex variables

3-1. Find the roots of $z^6+27=0$.

3-2. Find the image of $x=-1$, $y=2$ in w-plane and $u=-1$, $v=2$ in z-plane for $f(z) = (z+1)(z-1)^{-1}$.

3-3. Use Cauchy-Riemann equations to show that $f(z) = ze^{jz}$ is analytic and verify that its derivative is given by $f'(z) = u_x + jv_x$.

3-4. Use the Green's theorem to prove the Cauchy's integral theorem.

3-5. Find the Taylor's series of $f(z) = ze^{jz}$ about $z=0$.

3-6. Find the Laurent's series about all poles of $f(z)=\dfrac{z+3}{z^2+4z}$.

3-7. Consider $f(z)$ in 3-6, evaluate $\oint_C f(z)dz$ for C:$|z+3|=2$.

3-8. Evaluate the improper integral $\int_0^\infty \dfrac{dx}{1+x^8}$.

3-9. Find the inverse Laplace transform required in 1-1 by evaluating Bromwich integral.

3-10. Find the partial fraction of $\dfrac{3x^2+4x+2}{x^3-6x^2+11x-6}$.

LE 200 Assignment

Laplace Transform 6, (b,h)

1-1. Find the Laplace transform of $f(t)$, then solve the ODE.

1-2. Find the unit impulse response of the system specified by the ODE, then find the system output when the input is given by $f(t)$.

Fourier Transform 3, (b,i)

2-1. Find the Fourier series of $f(x)$ (or $f(t)$), then find the "steady-state" solution for the ODE.

2-2. Find the Fourier transform of $f(x)$ assuming that $p\to\infty$, i.e., consists of only one period.

Complex variables

3-1. Find the roots of $z^8+81=0$.

3-2. Find the image of $x=2$, $y=-1$ in w-plane and $u=1$, $v=1$ in z-plane for $f(z) = (z-1)(2z+1)^{-1}$.

3-3. Use Cauchy-Riemann equations to show that $f(z) = ze^{-jz}$ is analytic and verify that its derivative is given by $f'(z) = u_x + jv_x$.

3-4. Use the Green's theorem to prove the Cauchy's integral theorem.

3-5. Find the Taylor's series of $f(z) = ze^{-jz}$ about $z=0$.

3-6. Find the Laurent's series about all poles of $f(z) = \dfrac{1}{z^2+4z}$.

3-7. Consider $f(z)$ in 3-6, evaluate $\oint_C f(z)dz$ for C:$|z|=1$.

3-8. Evaluate the improper integral $\int_0^\infty \dfrac{dx}{1+x^6}$.

3-9. Find the inverse Laplace transform required in 1-1 by evaluating Bromwich integral.

3-10. Find the partial fraction of $\dfrac{8x+15}{x^3-9x}$.