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Computer Engineering.

Question 4

4a) Command window

```
clc
clear
close all

syms n(t)
eqn = diff(n,t,2) - diff(n,t) - 12*n == 144 + (t^3) + 12.5
cond = n(0) == 5, diff(n,t,2) == -0.5^2,
ysol = dsolve(eqn, cond)
t = 0:0.1:1.5
presley = subs(ysol)
fplot(yrmi)
grind on
legend (presley, location: best)
```

4b) Command window

```
clc
clear
close window

syms n(t) y(t)
eqn 1 = diff(y,t) - x*x == exp(-2*t);
eqn 2 = diff(x,t) + y == exp(-t);
```

eqn5 = (eqn1, eqn2)
cond = x(0) == 0, y(0) == 0;
Ans = dsolve (eqns, cond)
xsol(t) = Ans.x
ysol(t) = Ans.y

ii) visualizing the solution on graph seperatly continue with
fplot (xsol)
fplot (ysol)
grid on
legend (xsol, location, best)
legend (ysol, location, best)

iii) visualizing the solution on graphs together continue
fplot (xsol)
hold on
fplot (ysol)
grid on
legend (xsol, ysol, location, best)

4 c) Command window

```
clc
clear
close all
syms t w x k a
x = k * exp(-a*t) + sin(5*w*t) * cos(3*w*t)
f = laplace(x, t, s)
simplify(f)
pretty(ans)
```

ii) Syms t s

```
f = pi * / (cs^2) + 15 * pi * s + 24 * (pi ^ 3))
laplace(f)
Simplify(ans)
Pretty(ans).
```