

QUESTION 4 :

(4a)

Command window

clc

clear

close all

Syms n(t)

$$\text{Eqn} = \text{diff}(n, t, 2) - \text{diff}(n, t) - 12 * n = 144 + (t^3) + 12.5;$$

$$\text{Cond} = n(0) == 5, \text{diff}(n, t, 2) == -0.5;$$

ysol = dsolve(Eqn, Cond)

$$t = 0:0.1:1.5$$

Yemi = subs(ysol)

plot(Yemi)

grid on

legend('Yemi', 'location', 'best')

(4b)

Command window

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Syms n(t) y(t)

$$\text{Eqn1} = \text{diff}(y, t) - x * x == \exp(-1 * t);$$

$$\text{Eqn2} = \text{diff}(x, t) + y == \exp(-t);$$

$$\text{Eqn5} = [\text{Eqn1}, \text{Eqn2}];$$

$$\text{Cond} = x(0) == 0, y(0) == 0;$$

Ans = dsolve(Eqn5, Cond)

$$xSol(t) = Ans * x$$

$$ySol(t) = Ans * y$$

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ii) Visualizing the solution on graph separately continue with  
`fplot(xSol)`  
`fplot(ySol)`  
`grid on`  
`legend('xSol', 'location', 'best')`  
`legend('ySol', 'location', 'best')`

Quiz  
 Write a C++ program to check whether it is even or odd

Answer:  
`#include <iosfrea`

iii) Visualizing the solution on graphs together continue  
`fplot(xSol)`  
`hold on`  
`fplot(ySol)`  
`grid on`  
`legend(xSol, 'ySol', 'location', 'best')`

(Using namespace std)

```
int main()
int a = 2, 4, 6,
int b = 1, 3, 5, 7,
return Int(x = a)
cout << x << endl
Int(y = b)
cout << y << endl
```

4c

Command window

`cle`

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`close all`

Syms t s w x k a

$$x = k * \exp(-a * t) + \sin(b * w * t) + \cos(b * w * t)$$

$$f = \text{laplace}(x, t, s)$$

`simplify(f)`

`pretty(ans)`

ii) Syms t s

$$f = \text{pi} * \sqrt{(s^2) + 15 * \text{pi} * s + 24 * (\text{pi}^3)}$$

`lplace(f)`

`simplify(ans)`

`pretty(ans)`