

Mehendi Hasan

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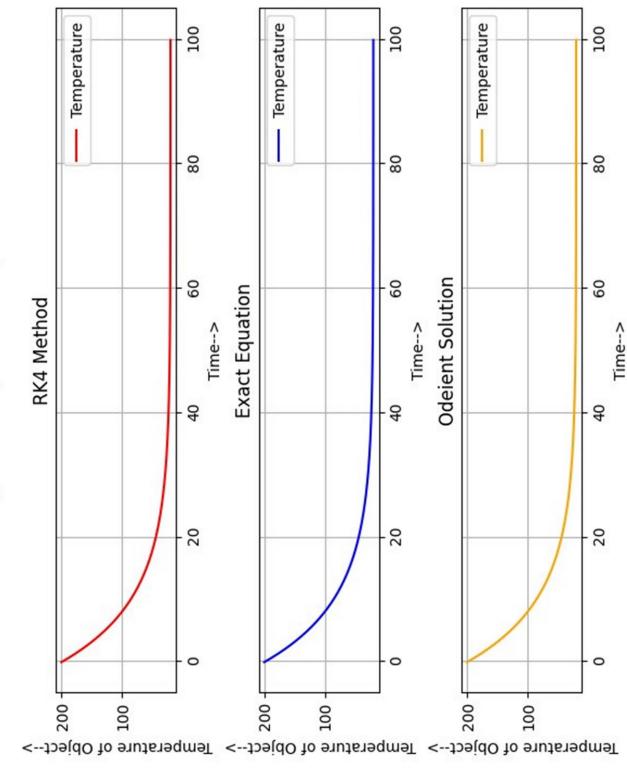
Enter Initial value of X: 0

Enter Value of Y at Initial value of X: 1

Enter Step Size: 0.001

Enter last value of interval: 10

To Plot Newton's cooling law ODE by RK4 method, Exact solution & Inbuilt solver Mehendi Hasan B.SC.(H) Physics



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Newton's Law of Cooling

Temperature is in Degree Celsius and time is in seconds

Enter initial Temperature of Object: 200 Enter Surrounding temperature: 20

Enter time from t=0, at which temperature of Object to be calculated: 100

Mehendi Hasan B.SC.(H) Physics 2230248 To Plot Radioactive Decay ODE by RK4 method, Exact solution & Inbuilt solver. Number of Parent Atoms Number of Parent Atoms Number of Parent Atoms 10 10 10 α ∞ **Exact Equation Solution** Odeint Solution RK4's Solution Time (Second) Time (Second) Time (Second) 1000 200 1000 200 1000 200 No. of parent Atoms No. of parent Atoms No. of parent Atoms

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Radioactive Decay

Time is in Seconds

Enter Number of Parent Atoms at t=0: 1000

Enter time instant at which Remaining of Parent Atoms to be calculated: 10

Enter Radioactive Decay constant value: 101

To Plot Charging and Discharging of a capacitor in RC circuit ODE with DC source by RK4 Method, Exact solution, Inbuilt solver 1000 1000 Charge Charge Charge 800 800 800 Odeint Solution of Charging Exact Equation of Charging RK4's Solution of Charging 009 900 009 Time Time Time 400 400 400 200 200 200 Mehendi Hasan B.SC.(H) Physics 2230248 100 20 100 20 100 20 Charge at Capacitor Charge at Capacitor Charge at Capacitor 1000 1000 1000 Charge Charge Charge 800 800 800 Odeint Solution of Discharging **Exact Equation of Discharging** RK4's Solution of Discharging 009 009 009 Time Time Time 400 400 200 200 200 100 20 100 20 100 20 Charge at Capacitor Charge at Capacitor Charge at Capacitor

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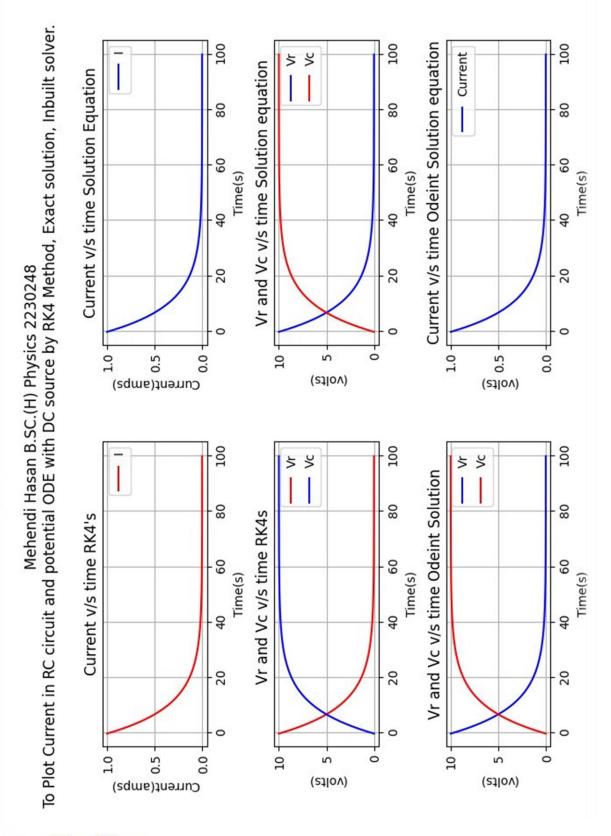
RC Circuit Charging and Discharging of Capacitor

Capacitance is in Farad, resistance is in ohm, time is in second, charge in coulomb, voltage in volts.

Enter Capacitance of Capacitor: 1 Enter EMF of Battery: 100

Enter Resistance of Resistor: 100

Enter time instant at which charge on capacitor to be calculated: 1000



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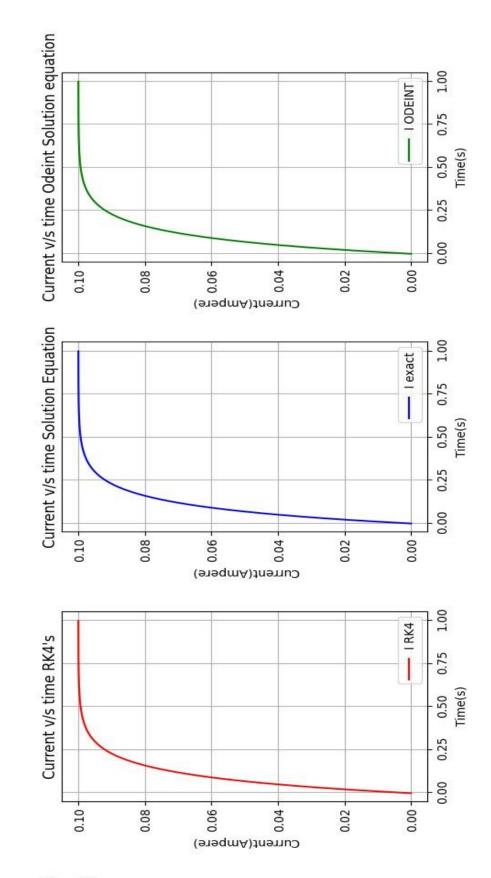
RC Circuit

Capacitance is in Farad, resistance is in ohm,time is in second,charge in coulomb,voltage in volts.

Enter the value of resistance in ohms:10
Enter the value of capacitance in farads:1
Enter the value of EMF in volts:10
Enter time instant at which current to be measured:100

To Plot Current in RL circuit ODE with DC source by RK4 Method, Exact solution, Inbuilt solver. Mehendi Hasan B.SC.(H) Physics 2230248

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Variation of curent with time in RL Circuit

Resistance is in ohm,time is in second,Inductance in henry,voltage in volts.

Enter Inductance of Inductor: 10 Enter EMF of Battery: 10

Enter Resistance of Resistor: 100

Enter time instant at which Current through inductor to be calculated: 1