**CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENTS**



**Problem 1**

Course Title: System Integration with Dymola

Course Code: CUTM1022 (0-0-2)

**Submitted to:**

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Semester: 4th Sem

Section: C

**Problem No. 1:**

A solenoid with an inductance of 25 mH and resistance of 8Ω are connected to the terminals of a 6-V battery in series. There is also a switch in the circuit.

1. Find the final current in the circuit.
2. Check and verify using Modelica

**Requirements:**

OpenModelica software

**Procedure:**

Step 1: Open Openmodelica connection editor

Graphical user interface, application

Description automatically generated

Graphical user interface

Description automatically generatedStep 2: Click on New Modelica class, give a new Modelica class name, then click on ok

Step 3: Then this type of page will appear

A picture containing white, tub, bath

Description automatically generated

Step 4: Go to Modelica packages, then go to electrical, then analog, then basic, then drag resistor and ground to the modeling field , then choose the constant voltage from source packages.

I connected the connection between positive terminal of ConstantVoltage and registor, the connection between negative terminal of resistor and positive terminal of inductor, then connecton between negative terminal of inductor to the ground, finally connection between negative terminal of constantVoltage to the ground.

Add some information of the modeling

Graphical user interface, text, application, email

Description automatically generatedDiagram, schematic

Description automatically generated

Step 5: After the completion of modeling then save the Modelica file into your pc as .mo extensions, after that go for simulation, when clicking on simulation then compilation occurs, graphical language changes into modelica language.

model problem\_1

Modelica.Electrical.Analog.Basic.Ground ground annotation(

Placement(visible = true, transformation(origin = {-1, -49}, extent = {{-13, -13}, {13, 13}}, rotation = 0)));

Modelica.Electrical.Analog.Basic.Resistor resistor(R = 8) annotation(

Placement(visible = true, transformation(origin = {-1, 67}, extent = {{-15, -15}, {15, 15}}, rotation = 0)));

Modelica.Electrical.Analog.Basic.Inductor inductor(L = 0.025) annotation(

Placement(visible = true, transformation(origin = {45, 69}, extent = {{-11, -11}, {11, 11}}, rotation = 0)));

Modelica.Electrical.Analog.Sources.ConstantVoltage constantVoltage(V = 6) annotation(

Placement(visible = true, transformation(origin = {-66, 0}, extent = {{-14, -14}, {14, 14}}, rotation = -90)));

equation

connect(constantVoltage.p, resistor.p) annotation(

Line(points = {{-66, 14}, {-66, 67}, {-16, 67}}, color = {0, 0, 255}));

connect(resistor.n, inductor.p) annotation(

Line(points = {{14, 67}, {24, 67}, {24, 70}, {34, 70}}, color = {0, 0, 255}));

connect(inductor.n, ground.p) annotation(

Line(points = {{56, 70}, {76, 70}, {76, -36}, {0, -36}}, color = {0, 0, 255}));

connect(constantVoltage.n, ground.p) annotation(

Line(points = {{-66, -14}, {-66, -36}, {0, -36}}, color = {0, 0, 255}));

annotation(

uses(Modelica(version = "4.0.0")),

Documentation(info = "<html><head></head><body>In this Solenoid<div>Inductance=L= 25mH= 0.025H</div><div>Resistance=8 ohm</div><div>V=6V</div><div>Simulating time=0.03sec</div><div>In this circuit I connected the connection between positive terminal of ConstantVoltage and registor, the connection between negative terminal of resistor and positive terminal of inductor, then connecton between negative terminal of inductor to the ground, finally connection between negative terminal of constantVoltage to the ground, then go for check, then go for simulating.</div><div><br></div></body></html>"));

end problem\_1;

Graphical user interface, application, Word

Description automatically generated

Step 6:after the compilation it will show you a plotting area where you have to plot, as per your given data you have to simulate.

A picture containing calendar

Description automatically generated

Answer:

1. Final current in the circuit is 0.749949 at 0.03s