EAST WEST UNIVERSITY

Department of Computer Science and Engineering

Course Title: Electrical Circuits

Course Number: 209

Semester: 4th

Project Title: PSpice Analysis for Maximum Power Transfer

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Date of Performance: 08-01-2022

Date of Report Submission: 09-01-2022

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Answer to the Question no:01

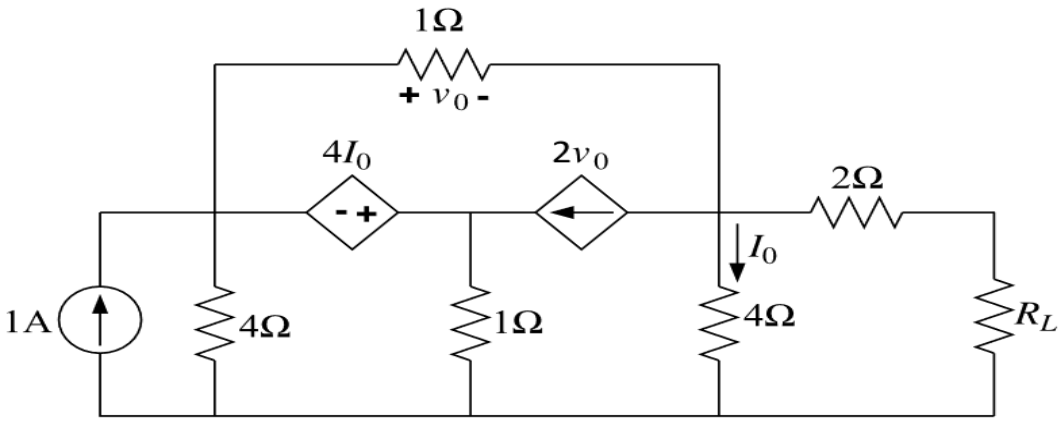

Figure 01: The original circuit given in the question

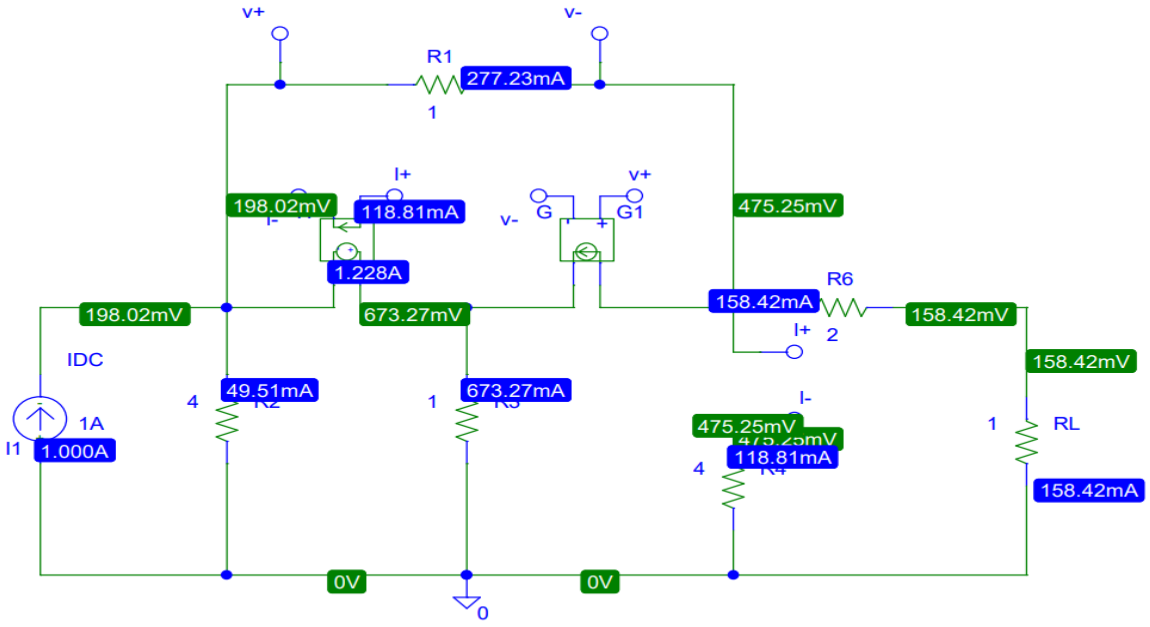

Figure 02: Simulated circuit from figure 1

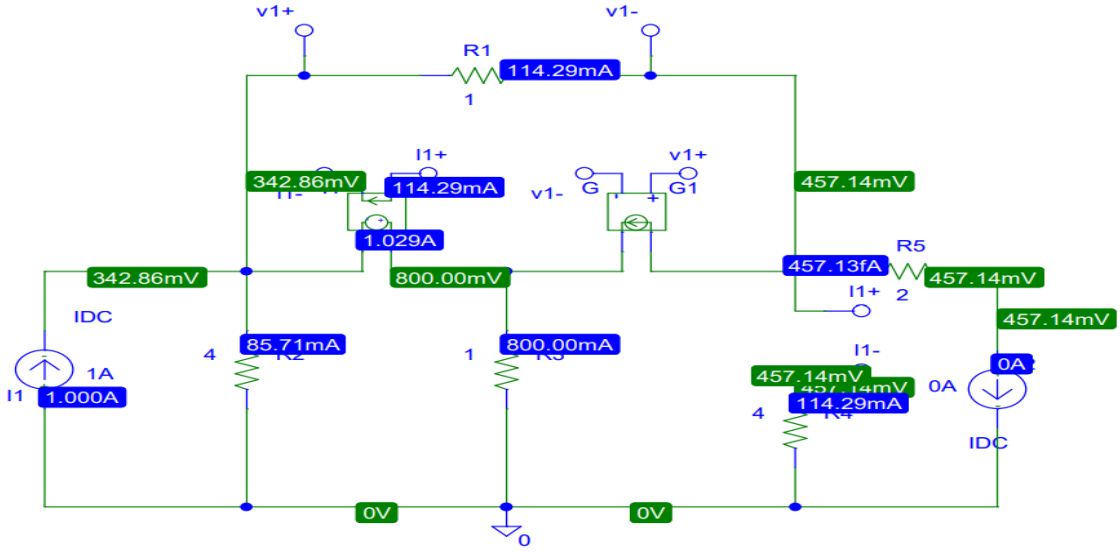

Figure 03: Circuit for finding V_{Th}

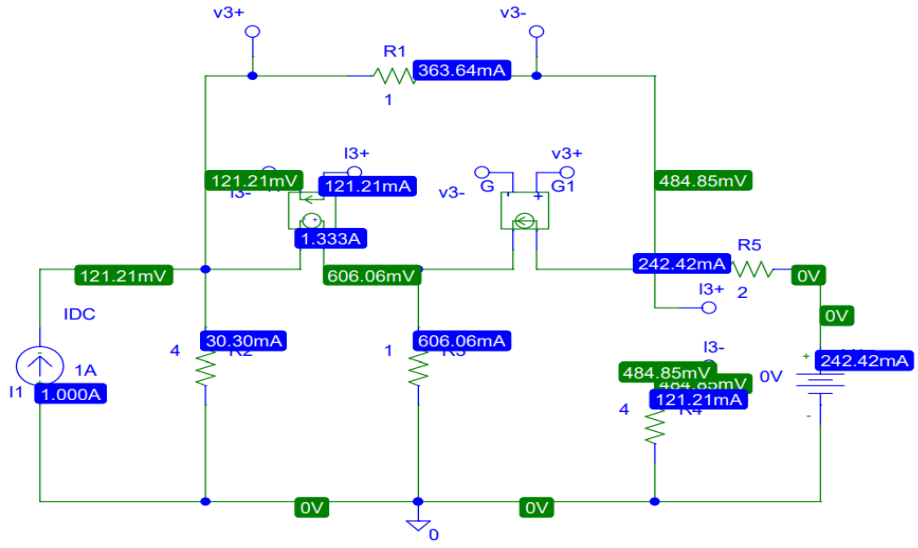

_Figure 04: Circuit for finding I_{sc}

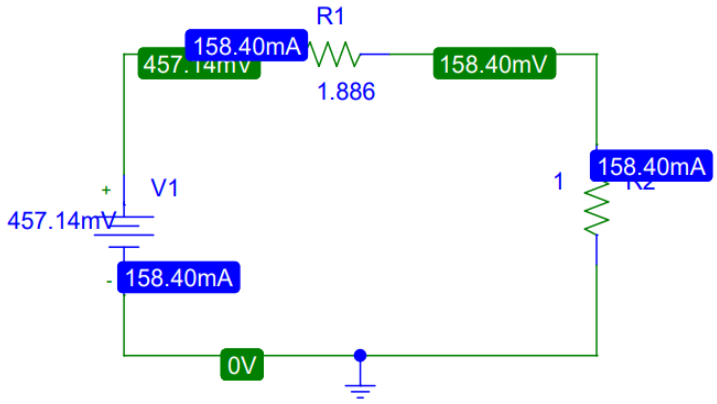

Figure 05: Thevenin's equivalent circuit

Answer to the Question no:02

From figure 01,

Applying KVL at SM , $4i3 + i2 + 4i3 - i3 - i0 - i3 = 2i2$.....(.i)

Applying KCL at node x, $i2 - i3 = 2i2$ .....(ii)

Applying KVL at mesh 1, $4 - 4i1 - 4i3 - i1 + i3 = 0$ .....(iii)

Solving equation (i),(ii),(iii);

$V_{\mathrm{Th}} = 4I_{\mathrm{o}} = 0.45714V = 457.14mV$

Again,from figure 01,

Applying KVL at SM , $4(i3 - i4) + i1 + 4(i3 - i4)i3 - i2 = 0$.....(i)

Applying KCL at node Y, $i1 - i3 = 2i1$ .....(ii)

Applying KVL at mesh 2, $-4i2 + 4(i3 - i4) - i2 + i3 = 0$ .....(iii)

Applying KVL at mesh 4, $4(i4 - i3) + 2i4 + 1 = 0$ .....(iv)

Solving equation (i),(ii),(iii),(iv); $R_{th} = RL = 1.88571\ ohm$

$P_{max} = (V_{Th})^2/4\ R_{th}$=0.0277 W=27.7 mW

Answer to the Question no:03

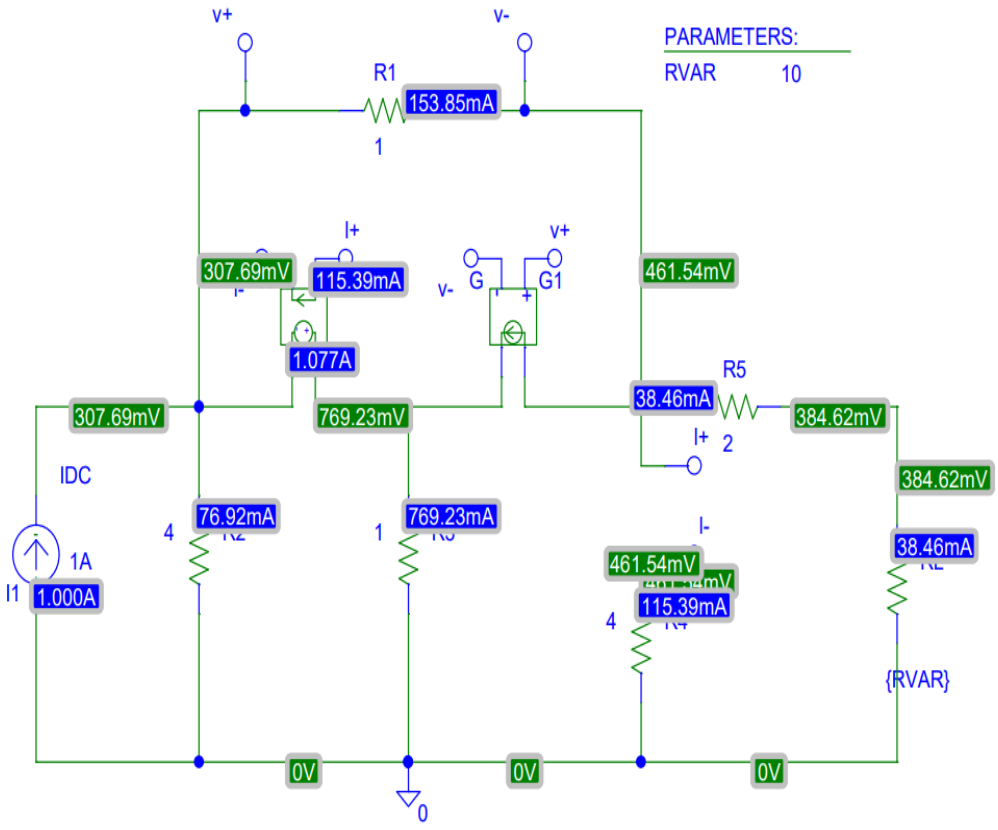

Figure 06: Maximum power circuit

Figure 07: R_L VS P_{max} graph

Answer to the Question no:04

Table 1. Comparison of R_L and maximum power:

	Step 2	Step 3
R_L	1.89 ohm	1.89 ohm
P_{max}	0.00277 W	27.706mW = 0.0277W

There is no discrepancy in the value of RL and maximum power obtained in step 2 and 3.