Started on	Saturday, 17 July 2021, 12:20 PM
State	Finished
Completed on	Saturday, 17 July 2021, 12:38 PM
Time taken	18 mins 49 secs
Grade	**5.71** out of 10.00 (**57**%)

Question 1

Partially correct

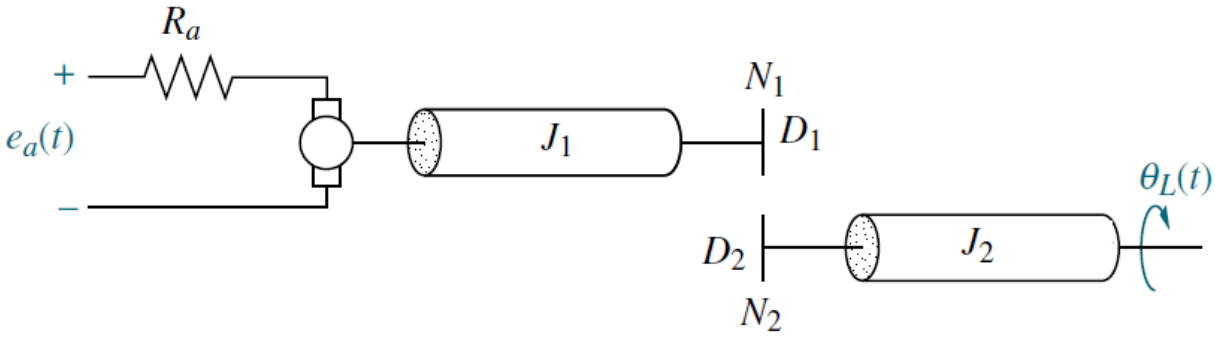
Mark 5.71 out of 10.00

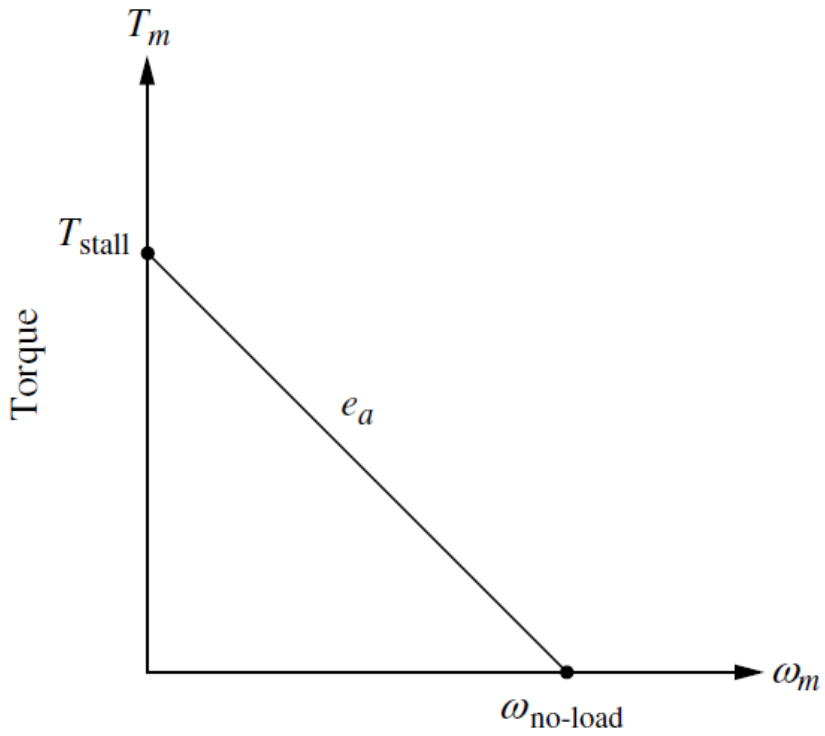
Answer the questions below, (**Insert the numerical value only, do not use <,>,+, *, or /**)

The Relative error for your answer should be less than 0.01, which means if the answer was 50, then the error should not exceed 50*0.01= ±0.5!

if the answer was 230, then the error should not exceed 230*0.01= ±2.3!

if the answer was 2.31467*10^-3, then you should enter this value: 0.00231467, not this 0.0023 !!!!





An armature controlled DC motor (Shown here), with unloaded shaft moment of inertia J1 equals 20 kg.m^2 and damping coefficient D1 of 24 N.m.s/rad, is used to control a mechanical load with moment of inertia J2 equals 28 kg.m^2 and damping coefficient D2 of 6 N.m.s/rad, through a gear with N1= 10 and N2=40. The rest of the Parameters are as follow:

e_a=40 V. T_{stall}=100 N.m. ω_{nl}=200 rad/s.

The motor characteristic parameter Kt/Ra = 2.5

One possible correct answer is: 2.5

The motor characteristic parameter Kb = 0.2

✔

One possible correct answer is: 0.2

The transfer function is written as follow: $G(s)=\frac{\omega_L(s)}{Ea(s)}=\frac{k1}{s+k2}$.

The value of K1 = 0.11

✖

One possible correct answer is: 0.028735632183908

The value of K2 = 1.14

✔

One possible correct answer is: 1.1436781609195

You are asked to determine the response for an input voltage of 40 volts. which can be written in the following form:

$\omega_L(t)=(A+B\,e^{Ct})u(t)$

The value of A is: 0

✖

One possible correct answer is: 1.0050251256281

The value of B is: 4.597

✖

One possible correct answer is: -1.0050251256281

The value of C is: -1.14

✔

One possible correct answer is: -1.1436781609195

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