

بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



جامعة عين شمس

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FACULTY OF ENG.
EL-MINIA UNIVERSITY, EGYPT

SIMULATING OF A DIRECT CURRENT MACHINE BY ACTIVE CIRCUITS

A Thesis

Submitted in partial fulfillment of the
requirements for the degree of Master of science in
Electrical Engineering

By

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*I would like to dedicate this work
to my husband Ali, who provided
a great deal of help and support Also,
to my children Reem, Mayar,
Mohamed, and to my Father and
Mother.*

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 ARABIC ABSTRACT	

NOMENCLATURE

NOMENCLATURE

Symbol	Description	Unit
b	Internal bias for a node	—
B_m	Damping coefficient	N. m. s
E_a	The armature electromotive force (emf)	volt
i_a	Armature current	Amp
i_{a_m}	Maximum armature current	Amp
i_f	Field current	Amp
i_{f_m}	Maximum field current	Amp
i_{f_s}	Series field current	Amp
i_s	Saturation current	Amp
i_t	Terminal current	Amp
I_a	Rated armature current	Amp
I_f	Rated field current	Amp
J	Inertia of rotor	kg. m ²
k_v	Equal $E_a/\omega r$ or T_e/i	V/rad/sec
		N.m / Amp
k_{v_m}	Max. value equal $L_{AF} i_{f_m}$	V/rad/sec
L_{AA}	Self inductance of armature winding	H
L_{AF}	Mutual inductance between field and rotating armature coils	H

L_{AF_s}	Mutual inductance between series field and armature winding	H
L_{FF}	Self-inductance of field winding	H
L_{FF_s}	Self-inductance of series field winding	H
L_{FS}	Mutual inductance between shunt and series	H
$\underline{P}$	Operator d/dt (Differentiation)	
$\underline{1/P}$	Denote integration	
r_a	Resistance of armature winding	ohm
r_f	Resistance of field winding	ohm
r_{fs}	Resistance of series field winding	ohm
r_{fx}	Resistance connected in series with field winding represented field rheostat to adjust field current	ohm
R_f	Equal $r_f + r_{fx}$	ohm
R	Equal $r_a + r_{fs}$	ohm
t	Real time	sec
T_e	Electromagnetic torque	N.m
T_L	Load torque	N.m
v_a	Voltage of rotor winding	Volt
v_f	Voltage of field winding	Volt
v_{fs}	Voltage of series field winding	Volt
v_t	Terminal voltage	Volt