

FUTURE INSTITUTE OF ENGINEERING AND ANAGEMENT

Department of Electrical Engineering

Electrical Machines Laboratory

Description: The Electrical Machines Laboratory is equipped with all types of AC and DC machines and Transformers mainly covered in the B.Tech. curriculum. The experiments provide the students a chance to put theory into practice. The laboratory helps the students to get familiar with DC machines, Transformers, synchronous machines and induction motors and give them experimental skills.

Major Facilities	: Equipped with different kinds of machines and measuring device
Faculty In-Charge	: Mr. Amitabha Bhattacharya, M.Tech, Assistant Professor
Technician	: Mr.Sunam Saha, B.Tech
Area	: 130.62 sq.m
No. of experiments	: 21
Courses conducted	: Electrical Machines-I (10), Electrical Machines-II (11)
Exclusive / Shared	: Exclusive

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List of Major Equipment

Sl. No	Major Equipment	Quantity
1	11 KVA,220 V Rectifier set	1
2	DC shunt Motor(2 Hp,220 V)-Alternator (4.5A,415 V) set	2
3	DC shunt Motor(2 Hp,220 V)-Salient pole Alternator (4.5A,415 V)set	1
4	3 ph induction motor(415 V,4.5 A)-DC Compound Generator (220 V,7 A)set	1
5	1ph induction motor(220 V,2 HP)-DC Shunt Generator (220 V,4.5A)set	1
6	Dc Shunt motor (2 HP,220 V)	1
7	Dc Series Motor(4.5 A,220 V) with Load	1
8	Synchronous motor(2 HP,415 V,1500 rpm)	1
9	Dc shunt motor(3 HP,220 V)-3 ph Induction Generator (415 V,2 HP)with Capacitor Bank	1
10	Dc Shunt motor (2 HP,220 V) with load	1
11	3 ph Slip ring Induction Motor(415 V ,3 HP,4.5 A)with Slip ring Starter	1
12	1ph induction motor(220 V,7.5 A,1 KW)with Load	1
13	3 ph Squirrel Cage Induction Motor(415 V ,7.4 A)with load set up	1
14	3 ph Squirrel Cage Induction Motor(415 V ,4.5 A,2.2 KW) with V/f drive	1
15	Six coil Alternator(1.5KVA,110V,8.5 A,1500 RPM)Coupled with 3 ph Squirrel Cage Induction Motor(415 V ,3 HP,1425 RPM)	1
16	3 ph Squirrel Cage Induction Motor(415 V ,11.5 A,5 KW) coupled with DC Shunt Generator(220 V,13.6 A,3KW)	1
17	3 ph Slip Ring Induction Motor(415 V ,4.5 A,2.2 KW)	1
18	3 ph Squirrel Cage Induction Motor(Pole Changing)(5 HP,415 V,7.5 A,Speed-960-2850 rpm)	1
19	DC Shunt Generator(220 V,6.2 A,1.5 KW,1450 RPM)-	1
20	Single phase Transformer(1KVA,110V/220V)	3
21	Drum Controller(220 V,4A,1 HP,1500 RPM)- 3 ph Slip Ring Induction Motor(440 V ,4.5 A,3 HP,1450 RPM)	1
22	3 ph Multi Winding Transformer(220 V/110 V,1 KVA)	1
23	3 Ph Variac (i/p-415V,o/p-0-415 V,8 A)	5
24	1 Ph Variac (i/p-220V,o/p-0-270 V,8 A)	2
25	1 Ph Variac (i/p-220V,o/p-0-270 V,2 A)	1
26	DC regulated power Supply(o/p-0-220 V, 2A)	2
27	DOL Starter(415 V,15 A)	1
28	Star -Delta Starter(415 V,15 A)	1
29	Slip Ring Starter(3 KVA,4.5 A,415 V)	2
30	Slip Ring Starter(5 KVA,7.5 A,415 V)	1
31	3 ph Inductive Load Box(415 V,10A)	1
32	3 ph Inductive Load Box(415 V,2A)	1
33	3 ph Resistive Load Box(110V,2A)	1
34	3 ph Resistive Load Box(415 V,4.5A)	1
35	1 ph Resistive Load Box(220V,10A)	1
36	1 ph Resistive Load Box(220V,1500 W)	1
37	3 ph Lamp Load Box	1
38	3 ph Capacitor Bank	1

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Electrical Machines Lab I

List of Experiments as per Syllabus

Sl. No	Name of the Experiment
1.	Study of the characteristics of a separately excited DC generator.
2.	Study of the characteristics of a DC Shunt motor.
3.	Study of methods of speed control of DC Shunt motor.
4.	Study of the characteristics of a compound DC generator (short shunt).
5.	Measurement of speed of DC series motor as a function of load torque.
6.	Study of equivalent circuit of a single phase transformer.
7(a).	Polarity test on a single phase transformer.
7(b).	Study of different connections of three phase transformer.
8.	Study of equivalent circuit of three phase Induction motor by no load and blocked rotor test.
9.	Study of performance of Wound Rotor Induction Motor under load.
10.	Study of performance of three phase Squirrel-cage Induction Motor – determination of iron-loss, friction & windage loss.

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Electrical Machines-II Lab

List of Experiments as per Syllabus

Sl.No	Name of the Experiment
1	Different methods of starting of a 3 phase Cage Induction Motor & their comparison [DOL, Auto transformer & Star-Delta]
2	Speed control of 3 phase squirrel cage induction motor by different methods & their comparison [voltage control & frequency control].
3	Speed control of 3 phase slip ring Induction motor by rotor resistance control.
4	Determination of regulation of Synchronous machine by a. Potier reactance method. b. Synchronous Impedance method.
5	Determination of equivalent circuit parameters of a single phase Induction motor.
6	Load test on single phase Induction motor to obtain the performance characteristics.
7	To determine the direct axis resistance [X_d] & quadrature reactance [X_q] of a 3phase synchronous machine by slip test.
8	Load test on wound rotor Induction motor to obtain the performance characteristics.
9	To make connection diagram to full pitch & fractional slot winding of 18 slot squirrel cage Induction motor for 6 poles & 4 pole operation.

List of Experiments beyond the Syllabus

Sl. No	Name of the Experiment
1	To study the performance of Induction generator.
2	V-curve of Synchronous motor.