STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME IN ELECTRICAL & ELECTRONICS ENGINEERING

Fifth Semester

Sr. No.	Subject	L	T	P	Total	Evaluation Scheme						
						Internal Assessment		External Assessment (Examination)				Total Marks
		Periods/Week				Theory	Practical	Theory		Practical		
						Max. Marks	Max. Marks	Max. Marks	Hrs.	Max. Marks	Hrs.	
	Industrial Training	-	-	-	-	-	25	-	-	25	-	50
5.1	A.C. Machines	5	-	4	9	20	30	50	2.5	50	3.00	150
5.2	Sub-Station Switchgear and Protection	4	-	2	6	20	30	50	2.5	50	3.00	150
5.3	Electronics in Industry	3	-	4	7	20	30	50	2.5	50	3.00	150
5.4	Consumer Electronics & Trouble shooting	3	1	4	8	20	30	50	2.5	50	3.00	150
5.5	Industrial Electronics and Control of Drives	5	-	3	8	20	30	50	2.5	50	3.00	150
5.6	Process Control & Instrumentation	4	-	2	6	25	25	50	2.5	50	3.00	150
General proficiency #		-	-	4	4	-	25	-	-	-	-	25
Indrustrial Exposure (Assesment at Inst. Level)+		-	-	-	-	-	25	-	-	-	-	25
Total		24	1	23	48	125	250	300	-	325	-	1000

General Proficiency will comprise of various co-curricular activities like games, hobby clubs, seminars, declamation contests, extension lectures, NCC, NSS and cultural activities etc.

\+ Industrial visit compulsory to minimum 2 industries or Departments.

Note:- 1. Each period will be 50 minutes.

2. Each session will be of 16 weeks.

3. Effective teaching will be at least 12.5 weeks.

5.1 AC MACHINES

L T P
Periods 5 - 4

RATIONALE

Electrical machines is a subject where a student will deal with various types of electrical machines which are employed in industries, power stations, domestic and commercial appliances etc. After studying this subject, an electrical diploma holder must be competent to repair and maintain these machines and give suggestions to improve their performance. Explanation of practical aspects of the subject will make the students capable of performing various tests on the machines as per latest BIS specifications

DETAILED CONTENTS

1. Synchronous Machines (30 Periods)

   1.1 Main constructional features of synchronous machine including commutator and brushless excitation system

   1.2 Generation of three phase emf

   1.3 Production of rotating magnetic field in a three phase winding

   1.4 Concept of distribution factor and coil span factor and emf equation
   Armature reaction at unity, lag and lead power factor

   1.5 Operation of single synchronous machine independently supplying a load - Voltage regulation by synchronous impedance method

   1.6 Need and necessary conditions of parallel operation of alternators
   Synchronizing an alternator (Synchroscope method) with the bus bars

   1.7 Operation of synchronous machine as a motor –its starting methods

   1.8 Effect of change in excitation of a synchronous motor

   1.9 Concept and Cause of hunting and its prevention

   1.10 Rating and cooling of synchronous machines

   1.11 Applications of synchronous machines (as an alternator, as a synchronous condenser)

2. Induction Motors (20 Periods)

   2.1 Salient constructional features of squirrel cage and slip ring 3-phase induction motors

   2.2 Principle of operation, slip and its significance

   2.3 Locking of rotor and stator fields

   2.4 Rotor resistance, inductance, emf and current

   2.5 Relationship between copper loss and the motor slip

   2.6 Power flow diagram of an induction motor

   2.7 Factors determining the torque

2.8 Torque-slip curve, stable and unstable zones

2.9 Effect of rotor resistance upon the torque slip relationship

2.10 Double cage rotor motor and its applications

2.11 Starting of 3-phase induction motors, DOL, star-delta, auto transformer

2.12 Causes of low power factor of induction motors

2.13 Testing of 3-phase motor on no load and blocked rotor test and to find efficiency

2.14 Speed control of induction motor

2.15 Harmonics and its effects, cogging and crawling in Induction Motors

3. Fractional Kilo Watt (FKW) Motors (18 Periods)

3.1 Single phase induction motors; Construction characteristics and applications

3.2 Nature of field produced in single phase induction motor

3.3 Split phase induction motor

3.3.1 Capacitors start and run motor

3.3.2 Shaded pole motor

3.3.3 Reluctance start motor

3.4 Alternating current series motor and universal motors

3.5 Single phase synchronous motor

3.5.1 Reluctance motor

3.5.2 Hysteresis motor

3.6 Comparison of 3 phase and Single phase Induction motor

3.7 Application of 3 phase and Single phase Induction motor

4. Special Purpose Machines (12 Periods)

Construction and working principle, characteristics and applications of linear induction motor, stepper motor, Servomotor, Submersible Motor, Introduction to Energy efficient Motors.

LIST OF PRACTICALS

1. Demonstration of revolving field set up by a 3-phase wound stator
2. To plot relationship between no load terminal voltage and excitation current in a synchronous generator at constant speed
3. Determination of the relationship between the voltage and load current of an alternator, keeping excitation and speed constant
4. Determination of the regulation and efficiency of alternator from the open circuit and short circuit test
5. Synchronization of poly phase alternators and load sharing
6. Determination of the effect of variation of excitation on performance of a synchronous motor
7. Study of ISI/BIS code for 3-phase induction motors
8. Perform at least two tests on a 3- phase induction motor as per BIS code