

# PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF ENGINEERING & TECHNOLOGY, BARGARH



## LESSON PLAN Session-2023-2024

Discipline: Electrical Engineering Engg. Semester: 5th


Subject: Energy Conversion-II

Name of the Teaching Faculty: Bimal Kumar Gachta

Subject: Energy Conversion-II No. of Days/per week class allotted 4

Semester From Date: 01.08.2023 To Date: 30.11.2023 No. of Weeks: 15


Week	Class Day	Theory /Practical Topics
1	1	Type of alternator and construction feature
	2	working principle and Relation between speed and frequency
	3	Terminology of armature winding and winding factor
	4	Harmonics causes and it's impact on winding factor
2	5	Emf equation of alternator with solved numerical
	6	Armature Reaction explanation
	7	Effect of armature Reaction on emf at different power factor of load.
	8	vector diagram of loaded alternator with problem solved.
3	9	Testing of alternator (open circuit) & short circuit)
	10	Solving numerical based on SC & OC Test.
	11	Determination of voltage Regulation by Direct loading & Synchronous impedance method
	12	Solved numerical on voltage Regulation.

  
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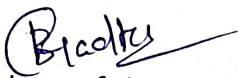
Week	Class Day	Theory / Practical Topics
4	13	Parallel operation using synchroscope and Dark-bright lamp method.
	14	Distribution of Load by parallel connected alternator.
	15	Synchronous motor construction, principle of operation & concept of load angle.
	16	Torque deviation & Power developed in synchronous motor.
5	17	Effect of varying load with constant excitation. effect of varying excitation with constant load.
	18	Power angle characteristics.
	19	Effect of excitation on alternator armature current & power factor.
	20	Hunting & function of Damper bar in synchronous motor & Generator.
6	21	Method of starting of synchronous motor.
	22	Application of synchronous motor.
	23	Production of Rotating magnetic field.
	24	Construction of squirrel cage & slip ring I/m

  
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Week	Class Day	Theory /Practical Topics
7	25	working principle of 3 $\phi$ Induction motor.
	26	Slip speed, slip & Relation of slip with rotor parameter.
	27	Expression of torque during starting & Running condition & max <sup>m</sup> torque.
	28	Torque - slip characteristics
8	29	Relation between full-load torque & starting torque.
	30	Rotor cu loss, Rotor output, Gross torque & relation between slip & Rotor cu loss
	31	Method of starting & Different starters for 3- $\phi$ Induction motor.
	32	Speed control by voltage control & Rotor Resistance control
9	33	Speed control by Pole changing & frequency control.
	34	Different type of motor enclosure.
	35	Plugging in 3 $\phi$ Induction motor.
	36	Principle of Induction Generator & it's application

  
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Week	Class Day	Theory /Practical Topics
10	37	Ferraris's Principle
	38	Double revolving field theory & cross field theory to analyze starting torque of $1\phi$ T/m.
	39	Working Principle, Torque-speed characteristics performance characteristics.
	40	Application of split phase motor & Capacitor start motor.
11	41	Application of Capacitor start - capacitor Run motor.
	42	Application of Permanent capacitor type motor.
	43	Application of shaded pole motor.
	44	Method of changing direction of rotation.
12	45	Construction & working principle of commutator motor.
	46	Running characteristics & application of $1-\phi$ series motor.
	47	Construction of Universal motor.
	48	Working principle & application of Universal motor.

  
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Semester From Date : 01.08.2023 To Date : 30.11.2023 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
13	49	Working principle of repulsion start motor.
	50	Repulsion start Induction run motor, Repulsion Induction motor.
	51	Principle of stepper motor.
	52	Classification of stepper motor
14	53	Principle of variable Reluctant & permanent magnet stepper motor.
	54	Principle of hybrid stepper motor.
	55	Application of stepper motor.
	56	Grouping of winding & Advantage
15	57	Parallel operation of 3 $\phi$ T/F
	58	Parallel operation of 3 $\phi$ T/F
	59	Tap changer (ON/OFF & Load Changing)
	60	Maintenance schedule of power T/F

  
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