



**GOVT. POLYTECHNIC KORAPUT  
DEPARTMENT OF ELECTRICAL ENGG.**

LESSON PLAN

Name of the faculty : R.hansda  
 Discipline: ----- : Electrical  
 Semester : 4th  
 Subject : Energy Conversion-1  
 Duration : 2020-21  
 Work load per week : Total Period-75 (60L + 15T)

Week	Theory		
	Lecture day		Topic
1	1	1	<b>DC GENERATORS 17</b> -Introduction, machines types, operation principle of generator
	2	2	Constructional features of dc generators yoke, pole & field winding, armature, commutator
	3	3	Armature winding, backpitch, frontpitch, resultant pitch, commutator pitch
	4	4	Simple lap and wave winding, dummy coils, types of dc generators (shunt, series, compound)
	5	T1	Tutorial
2	1	5	Shunt series compound dc m/c, derivation of EMf equation of dc generators
	2	6	Solve problems
	3	7	Losses and efficiency of dc generator, condition for maximum efficiency and numerical problem
	4	8	numerical problem
	5	T2	Tutorial
3	1	9	Armature reaction in dc machines
	2	10	Comutation and methods of improving comutation.
	3	11	Role of inter poles and compensating winding in comutations.
	4	12	Character of dc generators. Application of different types of dc generators.
	5	T3	Tutorial
4	1	13	Concept of critical resistance and critical of speed of dc shunt generator
	2	14	Condition of build up of emf of dc generator.
	3	15	Parallel operation of dc generator.
	4	16	Uses of dc generators.
	5	17	Uses of dc generators.
5	1	1	<b>2.D. C. MOTORS-15</b> Basic working principle of DC motor
	2	2	Significance of back emf in D.C. Motor.
	3	3	Voltage equation of D.C. Motor and condition for maximum power output (simple problems)
	4	4	Derive torque equation (solve problems)
	5	T4	Tutorial
6	1	5	Characteristics of shunt, series and compound motors and their application
	2	6	Starting method of shunt, series and compound motors
	3	7	Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems
	4	8	Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems
	5	T5	Tutorial
7	1	9	Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method



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2	10	Determination of efficiency of D.C. Machine by Brake test method(solve numerical problems)
3	11	Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems)
4	12	Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems)
5		Tutorial
1	13	Losses, efficiency and power stages of D.C. motor(solve numerical problems)
2	14	Losses, efficiency and power stages of D.C. motor(solve numerical problems)
3	15	Uses of D.C. motors
4	1	<b>3. SINGLE PHASE TRANSFORMER-20</b> -Introduction, Defination Working principle of transformer
5		<b>Tutorial</b>
1	2	Constructional feature of Transformer
2	3	Arrangement of core & winding in different types of transformer.
3	4	Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc.
4	5	Explain types of cooling methods
3	6	State the procedures for Care and maintenance.
4	7	EMF equation of transformer.
5		Tutorial
1	8	Ideal transformer voltage transformation ratio
2	9	Operation of Transformer at no load, on load with phasor diagrams
	10	Equivalent Resistance, Leakage Reactance and Impedance of transformer.
4	11	To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load.
5		Tutorial
1	12	To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load.
2	13	To explain Equivalent circuit and solve numerical problems.
3	14	Approximate & exact voltage drop calculation of a Transformer.
4	15	Regulation of transformer. Different types of losses in a Transformer. Explain Open circuit and Short Circuit test.(Solve numerical problems)
5		Tutorial
1	16	Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)
2	17	Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)
3	18	Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)
4	19	Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)
5		Tutorial



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13	1	20	Explain All Day Efficiency (solve problems)
	2	1	Determination of load corresponding to Maximum efficiency.
	3	2	Parallel operation of single phase transformer
	4	3	Parallel operation of single phase transformer
	5		<b>Tutorial</b>
13	1		<b>4. AUTO TRANSFORMER-3-</b> Constructional features of Auto transformer
	2		Working principle of single phase Auto Transformer , Comparison of Auto transformer with an two winding transformer (saving of Copper).
	3		Uses of Auto transformer. 4.5. Explain Tap changer with transformer (on load and off load condition)
	4		Tutorial
13	1		Tutorial
	2		Tutorial
	3		Tutorial
	4		Tutorial
	5		Tutorial
14	1		Tutorial
	2		Tutorial
	3		Tutorial
	4		Tutorial
	5		Tutorial
15	1		Revision
	2		Revision
	3		Revision
	4		Revision
	5		Revision
15	1		Revision
	2		Revision
	3		Revision
	4		Revision
	5		Revision

Signature of concerned faculty

H.O.D Electrical