Lesson plan

Name if the faculty : Mr. Manoj Bansal

Discipline : Electrical & Electronics Engineering

Semester : 3rd

Subject : Electrical Machine- I (Paper Code: PCC-EE-209-G)

Lesson Plan Duration : 15 weeks (From August, 2020 to November 2020)

Work Load (Lecture/ Practical) per week (in hours): Lecture-02, Practical-01

Week	**Theory**		**Practical**	
	Lecture day	**Topic(Including assignment/test)**	**Practical Day**	**Topic**
1st	1st	Review of magnetic circuits - MMF	1st	To study conversion of 3 Phase to six phase using 3 single phase transformers
	2nd	Flux, reluctance & inductance		
2nd	1st	Review of Ampere Law and Biot Savart,s Law	2nd	To study three phase rectifiers & supply configuration . In 3 phase
	2nd	Visualization of magnetic fields produced by a bar magnet and a current carrying coil through air and through a combination of iron and air		
3rd	1st	Influence of highly permeable materials on the magnetic flux lines	3rd	To perform Sumpner's Back to back test on 1-phase transformers
	2nd	B-H curve of magnetic materials		
4th	1st	Flux-linkage vs current characteristic of magnetic circuits	4th	To study Parallel operation of two 1-phase transformers
	2nd	Linear and nonlinear magnetic circuits; energy stored in the magnetic circuit		
5th	1st	Force as a partial derivative of stored energy with respect to position of a moving element	5th	To perform load test on DC shunt generator
	2nd	Torque as a partial derivative of		

		stored energy with respect to angular position of a rotating element.		
6th	1st	Examples - galvanometer coil, relay contact, lifting magnet, rotating element with eccentricity or saliency	6th	To study Speed control of DC shunt motor
	2nd	Basic construction of a DC machine, magnetic structure - stator yoke, stator poles, pole-faces or shoes, air gap and armature core		
7th	**Sessional -I Examination+Activity**			
8th	1st	Visualization of magnetic field produced by the field winding excitation with armature winding open	7th	To study Swinburne's test of DC shunt motor
	2nd	Air gap flux density distribution, flux per pole, induced EMF in an armature coil		
9th	1st	Armature winding and commutation - Elementary armature coil and commutator, lap and wave windings	8th	To study Hopkinson's test of DC shunt M/Cs
	2nd	Construction of commutator, linear commutation Derivation of back EMF equation		
10th	1st	Armature MMF wave, derivation of torque equation, armature reaction, air gap flux density distribution with armature reaction.	9th	To syudy Ward Leonard method of speed control.
	2nd	Armature circuit equation for motoring and generation		

11th	1st	Types of field excitations - separately excited, shunt and series	10th	Three-phase transformer - construction, types of connection and their comparative features
	2nd	. Open circuit characteristic of separately excited DC generator, back EMF with armature reaction		
12th	1st	Voltage build-up in a shunt generator, critical field resistance and critical speed.V-I characteristics	11th	Parallel operation of single-phase and three-phase transformers, Autotransformers - construction, principle, applications and comparison with two winding transformer
	2nd	Torque-speed characteristics of separately excited, shunt and series motors		
13th	1st	Speed control through armature voltage. Losses	12th	Magnetizing current, effect of nonlinear B-H curve of magnetic core material
	2nd	Load testing and back-to-back testing of DC machines		
14th	1st	Principle, construction and operation of single-phase transformers	13th	Harmonics in magnetization current, Phase conversion - Scott connection, three-phase to six-phase conversion
	2nd	Equivalent circuit, phasor diagram, voltage regulation, losses and efficiency		
15th	1st	Testing - open circuit and short circuit tests, polarity test, back-to-back test	14th	Tap-changing transformers - No-load and on-load tap-changing of transformers, Three-winding transformers. Cooling of transformers.
	2nd	Separation of hysteresis and eddy current losses		
16th	**Sessional -II Examination+Activity**			

Faculty Signature