LESSON PLAN

DEPT.OF ELECT.ENGG GOVT.POLY.BHADRAK ESTD-2017

SUBJECT:-DC MACHINES &TRANSFORMER

BRANCH:- ELECTRICAL ENGG.

SEMESTER:3rd

NAME OF FACULTY: - ABHIPSA DUTTA

GOVERNMENT POLYTECHNIC, BHADRAK

SESSION:2025-26

Hod Electrical 11-07-25

HOD (ELECT.)
G.P.BHADRAK

Academic Co-ordinator

Academic Co-ordinator

Principal
Govt. Polytechnic Bhadrak 11.07.25

Principal
Govt.Polytechnic
Bhadrak

LEARNING OUTCOMES:

After completion of thecourse, thestudentswillbeableto

- Explain the constructionandworkingprincipleofdc machines.
- Describetheperformancecharacteristicsofdcmotoranddcgenerator.
- Explainthe constructionandworkingprincipleoftransformer.
- Describetheperformanceofsingle phaseandthree-phasetransformer.
- Discuss aboutspecialpurposetransformers

scipline: trical Engg.	Semester: 3rd	Name of the Teaching Faculty : ABHIPSA DUTTA
bject:DC hines and nsformers	No. of Days/per week class allotted:3	Semester from date: 14.07.2025 To Date: 15.11.2025 No. of Weeks:15
Week	Class Day	Topic/Sub-Topic
1st	1st	**I. DC Generators** 1.1 D.C.generator: Construction, parts, materials and their functions (Contd...)
	2nd	1.1 D.C.generator: Construction, parts, materials and their functions
	3rd	1.2 Principleof operationof DC generator 1.3 Fleming'srighthand rule
2nd	1st	1.4 DerivetheemfequationofDCGenerator
	2nd	1.5 SchematicdiagramsofdifferenttypesofDCgenerator
	3rd	1.6 SchematicdiagramsofdifferenttypesofDCgenerator
3rd	1st	1.7 Armaturereaction
	2nd	1.8 Commutation
	3rd	1.9 ApplicationsofD.C. generators
4th	1st	**II. D.C.Motors** 2.1D.C.motor:Typesof DC motors
	2nd	2.2 Fleming'sleft hand rule 2.3 PrincipleofoperationofBacke.m.f.anditssignificance

	3rd	2.4 Voltageequationof DC motor
5th	1st	2.5 TorqueandSpeed: Armaturetorque, Shafttorque,BHP,
	2nd	2.6 Braketest, losses, efficiency calculation of DC Motor
	3rd	2.7 DCmotorstarters:Necessity, explanation of two-point starter
6th	1st	2.8 Explanation of threepoint starter
	2nd	2.9 SpeedcontrolofDCshuntandseriesmotor:FluxandArmaturecontr methods
	3rd	2.10 BrushlessDC Motor:Construction andworking
7th	1st	**III. Single-phaseTransformers** 3.1 Construction:Partsandfunctions 3.2 Materialsusedfordifferentparts:CRGO,CRNGO,HRGO,amorph cores
	2nd	3.3 Typesof transformers:Shelltypeandcoretype
	3rd	3.4 Transformer:Principleofoperation
8th	1st	3.5 EMFequationoftransformer:Derivation,Voltage transformatio ratio
	2nd	3.6 Significanceoftransformer ratings
	3rd	3.7 Transformer No-load and on-loadphasor diagram, Leakagereactance (contd...)
9th	1st	3.8 Transformer No-load and on-loadphasordiagram,Leakage reactance
	2nd	3.9 Equivalentcircuitoftransformer:Equivalentresistanceandreactance

	3rd	3.10 VoltageregulationandEfficiency:Directloading
10th	1st	3.11 OC/SC method,All day efficiency
	2nd	**IV. Three Phase Transformers** 4.1Bankof threesinglephasetransformers(Y-Y,Δ-Δ,Δ-Y,Y-Δ)
	3rd	4.2 Single unit ofthreephasetransformer
11th	1st	4.3 DistributionandPowertransformers:Constructionand cooling
	2nd	4.4 Criteriaforselectionofdistributiontransformer,and power transformer
	3rd	4.5 Needofparalleloperationofthreephasetransformer ,Conditionsforparalleloperation.
12th	1st	4.6 Polaritytestsonmutuallyinductivecoilsandsinglephasetransformers.
	2nd	4.7 Polarityteston Three-phasetransformer
	3rd	4.8 PhasingouttestonThree-phasetransformer
13th	1st	4.9 Comparison and applications of single phase as well as three phase transformers
	2nd	**V. Special Purpose Transformers** 5.1 Singlephase Auto transformers:Construction,workingand applications.
	3rd	5.2 Threephaseautotransformers: Construction,workingand applications.
14th	1st	5.3 Working and Application of single phase auto-transformers
	2nd	5.4 Working and Applications of three phase auto-transformers
	3rd	5.5 Isolationtransformer:Construction

15th	1st	5.6 Isolationtransformer:Features and applications
	2nd	5.7 Key discussions on different types of machines
	3rd	5.8 Key discussions on different types of transformers

Abhipsa Dutta .

Signature of the faculty

Lect.in Elect.Engg.
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