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| Discipline: Electrical Engineering | Semester: 4th | Name of the Teaching Faculty: RUHIA HANSDA |
| Subject: ENERGY CONVERSION-1 | No. of Days/per week class allotted: 4+1 | Semester From Date: 10/03/2022 To Date: 10/06/2022 No. OF WEEKS- 13 |

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| PRE-REQUISITE | KCL,KVL,OHMS LAW,POPERTIES OF MAGNETIC MATERIAL | |
| COURSE OUTCOME | <p>On successful completion of the course, the student will be able to:</p> <p>CO1: Explain the working of DC Generators, Winding types and EMF equation</p> <p>CO2: Analyze Armature reaction in DC Generators, Commutation, and different characteristics including efficiency</p> <p>CO3: Understand working of DC Motors, and analyze types of DC motors, their characteristics, speed control and starting methods.</p> <p>CO4: Explain the construction, working, types of Transformers</p> <p>CO5: Understand equivalent circuit, regulation and efficiency</p> | |
| WEEK | CLASS DAY | THEORY/PRACTICAL TOPIC |
| 1ST | 1 ST | DC GENRATORS 17- Intoduction, machines types,operation principle of generator |
| | 2 ND | Constructional features of dc generatorsyoke,pole&fieldwinding,armature,commutator |
| | 3 RD | Armature winding, back pitch,frontpitch,resultant pitch, commutator pitch |
| | 4 TH | Simple lap and wave winding,dummycoils,types of dc generators(shunt ,series compound) |
| | 5 TH | Shunt series compound dc m/c,derivation of EMf equation of dc generators |
| 2ND | 1 ST | Solve problems |
| | 2 ND | Lossess and efficiency of dc generator,condition for maximum efficiency and numerical problem |
| | 3 RD | numerical problem |
| | 4 TH | Armature reaction in dc machines |
| | 5 TH | Comutation and methods of improving comutation. |
| 3RD | 1 ST | Role of inter poles and compensatingwinding in comutations. |
| | 2 ND | Character of dc generators.Application of different types of dc generators. |
| | 3 RD | Concept of critical resistance and critical of speed of dc shunt generator |
| | 4 TH | Condition of build up of emf of dc generator. |
| | 5 TH | Parallel operation of dc generator. |

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| 4 TH | 1 ST | Uses of dc genrators. |
| | 2 ND | 2.D. C. MOTORS-15 Basic working principle of DC motor |
| | 3 RD | Significance of back emf in D.C. Motor. |
| | 4 TH | Voltage equation of D.C. Motor and condition for maximum power output(simple problems) |
| | 5 TH | Derive torque equation (solve problems) |
| 5 TH | 1 ST | Characteristics of shunt, series and compound motors and their application |
| | 2 ND | Starting method of shunt, series and compound motors |
| | 3 RD | Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems |
| | 4 TH | Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems |
| | 5 TH | Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method |
| 6 TH | 1 ST | Determination of efficiency of D.C. Machine by Brake test method(solve numerical problems) |
| | 2 ND | Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems) |
| | 3 RD | Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems) |
| | 4 TH | Losses, efficiency and power stages of D.C. motor(solve numerical problems) |
| | 5 TH | Uses of D.C. motors |
| 7 TH | 1 ST | 3. SINGLE PHASE TRANSFORMER-20 -Introduction, Defination Working principle of transformer |
| | 2 ND | Constructional feature of Transformer |
| | 3 RD | Arrangement of core & winding in different types of transformer. |
| | 4 TH | Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc. |
| | 5 TH | Explain types of cooling methods |
| 8 TH | 1 ST | State the procedures for Care and maintenance. |

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DEPARTMENT OF ELECTRICAL ENGINEERING
LESSON PLAN

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| | 2 ND | EMF equation of transformer. | |
| D | 3 RD | Ideal transformer voltage transformation ratio | |
| S | 4 TH | Operation of Transformer at no load, on load with phasor diagrams | |
| | 5 TH | Equivalent Resistance, Leakage Reactance and Impedance of transformer. | |
| I | 9 TH | 1 ST | To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load. |
| | | 2 ND | To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load. |
| | | 3 RD | To explain Equivalent circuit and solve numerical problems. |
| | | 4 TH | Approximate & exact voltage drop calculation of a Transformer. |
| | | 5 TH | Regulation of transformer. Different types of losses in a Transformer. Explain Open circuit and Short Circuit test.(Solve numerical problems) |
| | 10 TH | 1 ST | Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems) |
| | | 2 ND | Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems) |
| | | 3 RD | Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems) |
| | | 4 TH | Explain All Day Efficiency (solve problems) |
| | | 5 TH | Determination of load corresponding to Maximum efficiency. |
| | 11 TH | 1 ST | Parallel operation of single phase transformer |
| | | 2 ND | . AUTO TRANSFORMER-3- Constructional features of Auto transformer, Working principle of single phase Auto Transformer |
| | | 3 RD | , Comparison of Auto transformer with an two winding transformer (saving of Copper). |
| | | 4 TH | Uses of Auto transformer. 4.5. Explain Tap changer with transformer (on load and off load condition) |
| | | 5 TH | 5. INSTRUMENT TRANSFORMERS-5- Explain Current Transformer |
| | 12 TH | 1 ST | Explain Potential Transformer |
| | | 2 ND | 1.2 Define Ratio error, Phase angle error, Burden. |
| | | 3 RD | 1.2 Define Ratio error, Phase angle error, Burden. |

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LESSON PLAN

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| | 4 TH | 1.3 Uses of C.T. and P.T. |
| | 5 TH | REVISION |
| 13 TH | 1 ST | REVISION |
| | 2 ND | REVISION |
| | 3 RD | SAMPLE PAPER PRACTICE |
| | 4 TH | SAMPLE PAPER PRACTICE |
| | 5 TH | |
| 14 TH | 1 ST | |
| | 2 ND | |
| | 3 RD | |
| | 4 TH | |
| | 5 TH | |
| 15 TH | 1 ST | |
| | 2 ND | |
| | 3 RD | |
| | 4 TH | |
| | 5 TH | |

LEARNING RESOURCES:

1. Principle of power system

V. K. Mehta,

S Chand

2. Electrical power

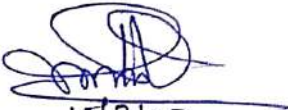
Soni, Gupta and Bhatnagar

Dhanpat Rai & Sons

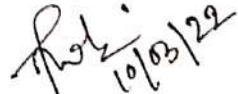
3. Power system protection & switch gear

Bhuvanesh Oza

TMH


10/3/22

Sign.of Faculty concerned


10/03/22
Sign. of HOD