

PNS SCHOOL OF ENGINEERING AND TECHNOLOGY

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| Branch: Electrical Engineering | Semester: 4 TH | Name of the Lecturer: Jayakanta Mallick |
| Subject: EC-I | No of lasses Alloted in a Week: 6 | Duration of Semester: 14.2.2023 - 23.5.2023 |
| Week | Class Day | Theory / practical Topic |
| 1st | 1 | DC Generator - Operating principle of generator |
| | 2 | Constructional features of DC machine (Yoke, Pole & field, Armature, Commutator) |
| | 3 | Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch |
| | 4 | Simple Lap and wave winding, Dummy coils |
| | 5 | Different types of D.C. machines (Shunt, Series and Compound) |
| | 6 | Derivation of EMF equation of DC generators with problems. |
| 2nd | 1 | Losses and efficiency of DC generator. |
| | 2 | Condition for maximum efficiency and numerical problems |
| | 3 | Armature reaction in D.C. machine |
| | 4 | Commutation and methods of improving commutation |
| | 5 | Role of inter poles and compensating winding in commutation |
| | 6 | Characteristics of D.C. Generators |
| 3rd | 1 | Application of different types of D.C. Generators, Concept of critical resistance and critical speed of DC shunt generator |
| | 2 | Conditions of Build-up of emf of DC generator, |
| | 3 | Parallel operation of D.C. Generators, |
| | 4 | Uses of D.C generators |
| | 5 | Class Test -I |
| | 6 | DC Motor - working principle of DC motor, Significance of back emf in D.C. Motor |
| 4th | 1 | Voltage equation of D.C.Motor and condition for maximum power output(problems) |
| | 2 | Derive torque equation (solve problems) |
| | 3 | Characteristics of shunt, series and compound motors and their application |
| | 4 | Starting method of shunt, series and compound motors |
| | 5 | Speed control of D.C shunt motors by Flux control method. Armature voltage Control method |
| | 6 | Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method |
| 5th | 1 | Determination of efficiency of D.C. Machine by Brake test method |
| | 2 | Numerical Problems |
| | 3 | Determination of efficiency of D.C. Machine by Swinburne's Test method |
| | 4 | Numerical Problems |
| | 5 | Losses, efficiency and power stages of D.C. motor(solve numerical problems) |
| | 6 | Uses of D.C. motors |
| 6th | 1 | Internal Assessment |
| | 2 | Single Phase Transformer - Working principle of transformer. |
| | 3 | Constructional feature of Transformer |
| | 4 | Arrangement of core & winding in different types of transformer |
| | 5 | Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc |
| | 6 | Explain types of cooling methods |

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| 7th | 1 | State the procedures for Care and maintenance |
| | 2 | EMF equation of transformer |
| | 3 | Ideal transformer voltage transformation ratio |
| | 4 | Operation of Transformer at no load with phasor diagram |
| | 5 | Operation of Transformer on load with phasor diagram |
| | 6 | Equivalent Resistance, Leakage Reactance and Impedance of transformer. |
| 8th | 1 | To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load. |
| | 2 | To explain Equivalent circuit and solve numerical problems |
| | 3 | Approximate & exact voltage drop calculation of a Transformer |
| | 4 | Regulation of transformer |
| | 5 | Different types of losses in a Transformer |
| | 6 | Explain Open circuit and.(Solve numerical problems) |
| 9th | 1 | Explain Short Circuit test .(Solve numerical problems) |
| | 2 | Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems) |
| | 3 | Explain All Day Efficiency |
| 9th | 4 | Numerical Problems |
| | 5 | Determination of load corresponding to Maximum efficiency. |
| | 6 | Parallel operation of single phase transformer |
| 10th | 1 | Class Test - II |
| | 2 | Autotransformer- Constructional features of Auto transformer |
| | 3 | Working principle of single phase Auto Transformer. |
| | 4 | Comparison of Auto transformer with a two winding transformer (saving of Copper). |
| | 5 | Uses of Auto transformer |
| | 6 | Explain Tap changer with transformer (on load and off load condition) |
| 11th | 1 | Instrument Transformers- Explain Current Transformer and Potential transformer |
| | 2 | Define Ratio error, Phase angle error, Burden |
| | 3 | Uses of C.T. and P.T |
| | 4 | Previous Semester Question Discussion |
| | 5 | Previous Semester Question Discussion |
| | 6 | Previous Semester Question Discussion |

Signature of the
Lecturer

Signature of the
H.O.D.