

PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF ENGINEERING & TECHNOLOGY, BARGARH



PROGRESS REGISTER

Session-2022-2023

Discipline: Electrical Engg.

Semester: 4th_A Subject: Energy Conversion -I.

Name of the Teaching Faculty: Bana Bihari Biswal.

Subject: EC-T. No. of Days/per week class allotted 5

Semester From Date : 14-02-2023 To Date : 23-05-2023 . No. of Weeks : 15

| Date | Topics to be covered as per Lesson Plan | Topics actually covered | Points/contents Discussed (in brief) | Signature of Teacher |
|----------|---|------------------------------------|--|----------------------|
| 14/02/23 | operating Principle of DC generator. | working Principle. | Principle Loop generator | <u>D. S. M.</u> |
| 15/02/23 | constructional features of DC generator | construction of DC generator. | stator-yoke, field, brush, Rotor - Armature commutator | <u>D. S. M.</u> |
| 16/02/23 | Armature winding. | Basic features of armature winding | Lap, wave winding, pitches applications. | <u>D. S. M.</u> |
| 17/02/23 | Types of DC generators | Types of excitation of DC machine. | separately excited, shunt, compound. | <u>D. S. M.</u> |
| 21/02/23 | Numerical. | Numerical Problem solving. | Problems on schematic diagrams. | <u>D. S. M.</u> |
| 22/02/23 | EMF equation. | Emf eqn | Derivation of EMF eqn. | <u>D. S. M.</u> |
| 23/02/23 | Numerical. | Numerical Problems | Problems based on emf eqn. | <u>D. S. M.</u> |
| 24/02/23 | Losses & efficiency of DC generator | losses & efficiency | Different losses Cu, iron, mechanical | <u>D. S. M.</u> |
| 25/02/23 | condition for maximum efficiency. | max. efficiency conditions. | Derivation of problem solving | <u>D. S. M.</u> |
| 28/02/23 | power stages & Numericals | power stage | Numerical on power stage | <u>D. S. M.</u> |
| 1/03/23. | Armature Reaction in DC machines. | Armature reaction | explanation, effect, GNA, MNA | <u>D. S. M.</u> |

Subject: EC-I No. of Days/per week class allotted 5

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| Date | Topics to be covered as per Lesson Plan | Topics actually covered | Points/contents Discussed (in brief) | Signature of Teacher |
|----------|--|-----------------------------------|---|----------------------|
| 02/03/23 | Commutation in DC machines | commutation | Explanation ideal, poor commutation | <u>D. S. M.</u> |
| 03/03/23 | Methods of Improving commutation | Improving methods. | Resistance & end commutation, inductance & compensating winding | <u>D. S. M.</u> |
| 04/03/23 | Characteristics of DC generators | generator characteristics | OCC, SCC, ECC curve & application | <u>D. S. M.</u> |
| 09/03/23 | Voltage build up of DC generators. | voltage build up process | Process & conditions of voltage build up | <u>D. S. M.</u> |
| 10/03/23 | Critical resistance & critical speed. | Critical speed & resistance. | Definition, Methods to find out | <u>D. S. M.</u> |
| 11/03/23 | Parallel operation of DC generators. | parallel operation. | Need, condition load sharing | <u>D. S. M.</u> |
| 14/03/23 | Working Principle of DC Motors. | Principle of DC Motors | Principle, back emf & its significance | <u>D. S. M.</u> |
| 15/03/23 | voltage eqn. & condition for maximum power | voltage eqn. Max. power condition | voltage eqn & Derivation of MPT condition | <u>D. S. M.</u> |
| 16/03/23 | Torque equation derivation. | Torque equation | Derivation of armature torque T_a & shaft torque, T_{sh} | <u>D. S. M.</u> |
| 17/03/23 | Numerical torque & voltage equation. | problem solving. | types of problems & solution | <u>D. S. M.</u> |
| 18/03/23 | Starting methods of DC motors. | starting of DC motors | Need for starter, 3 pt. starter. | <u>D. S. M.</u> |

Subject: EC-2. No. of Days/per week class allotted 5

Semester From Date : 14-02-2023 To Date : 23-05-2023 No. of Weeks : 15

| Date | Topics to be covered as per Lesson Plan | Topics actually covered | Points/contents Discussed (in brief) | Signature of Teacher |
|----------|---|-----------------------------------|---|----------------------|
| 21/03/23 | DC motor testing | Methods of starting. | 4 point & 2 point starters. | <u>[Signature]</u> |
| 22/03/23 | speed control of DC shunt motor | shunt motor speed control. | flux, armature voltage control methods | <u>[Signature]</u> |
| 23/03/23 | speed control of DC series motor | series motor speed control | flux, armature voltage control methods | <u>[Signature]</u> |
| 24/03/23 | Determination of efficiency by brake test | Brake test. | Explanation, procedure, formula | <u>[Signature]</u> |
| 25/03/23 | Determination of efficiency by Swinburne test | Swinburne's test. | Explanation, procedure, Adv & disadvantages | <u>[Signature]</u> |
| 28/03/23 | Numerical on testing | Numerical problems | solving problems | <u>[Signature]</u> |
| 29/03/23 | Losses, efficiency & power stages of DC motor | Losses, efficiency & power stages | types of losses, efficiency & power stages | <u>[Signature]</u> |
| 31/03/23 | Numerical on power stages | Problems | solving different problems. | <u>[Signature]</u> |
| 04/04/23 | characteristics & applications | characteristics & uses. | $T \propto I_a$, $N \propto I_a$, $N \propto T_a$, characteristics | <u>[Signature]</u> |
| 05/04/23 | working principle of transformer | operating principle | basic principle V, I, T, P . | <u>[Signature]</u> |
| 06/04/23 | constructional features | types of construction. | shell & core types - comparison | <u>[Signature]</u> |

Subject: EC-I. No. of Days/per week class allotted 5

Semester From Date: 14-02-2023 To Date: 23-05-2023 No. of Weeks: 15

| Date | Topics to be covered as per Lesson Plan | Topics actually covered | Points/contents Discussed (in brief) | Signature of Teacher |
|----------|---|---|--|----------------------|
| 08/04/23 | Constructional features. | additional components | conservator, breather, explosion vent etc. | <u>D. Siml</u> |
| 11/04/23 | cooling & Maintenance. | cooling, care & maintenance. | types of cooling, schedule of maintenance | <u>D. Siml</u> |
| 12/04/23 | EMF equation of transformer | EMF eqn. | Derivation of emf eqn | <u>D. Siml</u> |
| 13/04/23 | Ideal transformer & voltage transformation ratio. | ideal transformer | condition for ideal transformer | <u>D. Siml</u> |
| 15/04/23 | Transformer on no-load. | Transformer on no load condition. | Phasor Diagram current, pf at no-load | <u>D. Siml</u> |
| 18/04/23 | Transformer on load. | Ideal & practical transformers on load | loaded tr, phasor diagram | <u>D. Siml</u> |
| 19/04/23 | Equivalent circuit resistance, leakage reactance & impedance. | Equivalent parameters. | Calculation of equivalent resistance, leakage reactance & impedance. | <u>D. Siml</u> |
| 20/04/23 | Phasor diagram of practical transformer. | Phasor Diagram | Phasor diagram at upf, lagging & leading pf. | <u>D. Siml</u> |
| 21/04/23 | Equivalent circuit of transformer. | Exact & approximate equivalent circuit. | Development of approx. eq. circuit. | <u>D. Siml</u> |
| 25/04/23 | Numerical or eq. circuit. | Problems | Solving Problems. | <u>D. Siml</u> |
| 26/04/23 | Exact & approximate voltage drop. | Voltage drop Derivation. | Expression for exact & approx. voltage drop. | <u>D. Siml</u> |

Subject: EC - I . No. of Days/per week class allotted 5

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| Date | Topics to be covered as per Lesson Plan | Topics actually covered | Points/contents Discussed (in brief) | Signature of Teacher |
|----------|---|---|---|----------------------|
| 27/04/23 | Regulation of transformer. | voltage regulation | formula, pu formula, +ve, -ve regulation | <u>Dam</u> |
| 28/04/23 | Losses & open circuit test | oc test. | oc test, finding, R_0, X_0, W_{iron} . | <u>Dam</u> |
| 29/04/23 | short circuit test | s.c. test. | s.c. test, finding, Reg, Xeq, Zeq, Nsc | <u>Dam</u> |
| 02/05/23 | efficiency at different load & power factor | efficiency at different loading condition | Derivation of formula for different condition | <u>Dam</u> |
| 03/05/23 | condition & load corresponding to maximum efficiency | max efficiency condition & output | condition derivation, & rating formula | <u>Dam</u> |
| 04/05/23 | All day efficiency of transformer | All day efficiency | Defn. & significance of energy efficiency | <u>Dam</u> |
| 06/05/23 | Parallel operation of 1- ϕ transformers. | parallel operation | condition for parallel operation | <u>Dam</u> |
| 09/05/23 | Numerical | Numerical problems | solving problems on efficiency | <u>Dam</u> |
| 10/05/23 | Principle & constructional features of auto-transformer | Principle & construction. | Theory, exp- expression & constructional features | <u>Dam</u> |
| 11/05/23 | Comparison of core & toroidal transformer. | comparison | Saving in copper. | <u>Dam</u> |
| 12/05/23 | Advantages & disadvantages & application of auto-transformer. | Advantages & disadvantages (uses) | Different merits, demerits (uses). | <u>Dam</u> |

