

# ACADEMIC SESSION: 2022-23 (Summer-2023)

| Discipline : ELECTRICAL ENGINEERING |          |              | Semester :<br>4 <sup>th</sup>   | Name of the Teaching Faculty :<br>KIRAN KUMAR BHOI |
|-------------------------------------|----------|--------------|---|--|
| Subject : Energy Conversion-I       |          |              | Semester From date: 14/02/2023 to 23/05/2023  |  |
| SL NO.                              | DATE     | CHAPTER      | THEORY TOPIC NAME   | NO.OF PERIODS                                      |
| 1                                   | 15.02.23 | DC Generator | Operating principle of generator, Constructional features of DC machine.                | 1  |
| 2                                   | 16.02.23 |              | Yoke, Pole & field winding, Armature, Commutator  | 1  |
| 3                                   | 17.02.23 |              | Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch        | 1  |
| 4                                   | 20.02.23 |              | Simple Lap and wave winding, Dummy coils.   | 1  |
| 5                                   | 22.02.23 |              | Different types of D.C. machines (Shunt, Series and Compound)                           | 1  |
| 6                                   | 23.02.23 |              | Derivation of EMF equation of DC generators. (Solve problems)                           | 1  |
| 7                                   | 24.02.23 |              | Losses and efficiency of DC generator. Condition for maximum efficiency .               | 1  |
| 8                                   | 25.02.23 |              | numerical problems.   | 1  |
| 9                                   | 27.02.23 |              | Armature reaction in D.C. machine   | 1  |
| 10                                  | 01.03.23 |              | Commutation and methods of improving commutation.                                       | 1  |
| 11                                  | 02.03.23 |              | Role of inter poles and compensating winding in commutation                             | 1  |
| 12                                  | 03.03.23 |              | Characteristics of D.C. Generators<br>Application of different types of D.C. Generators | 1  |
| 13                                  | 04.03.23 |              | Concept of critical resistance and critical speed of DC shunt generator                 | 1  |
| 14                                  | 06.03.23 |              | Conditions of Build-up of emf of DC generator.  | 1  |
| 15                                  | 09.03.23 |              | Parallel operation of D.C. Generators.  | 1  |
| 16                                  | 10.03.23 |              | Uses of D.C generators.   | 1  |
| 17                                  | 11.03.23 | DC Motor     | Basic working principle of DC motor   | 1  |
| 18                                  | 13.03.23 |              | Significance of back emf in D.C. Motor.   | 1  |
| 19                                  | 15.03.23 |              | Voltage equation of D.C. Motor and condition for maximum power output                   | 1  |
| 20                                  | 16.03.23 |              | solve problems  | 1  |
| 21                                  | 17.03.23 |              | Derive torque equation (solve problems)   | 1  |

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| 22 | 18.03.23 |                          | Characteristics of shunt, series and compound motors and their application.   | 1 |
| 23 | 20.03.23 | DC Motor                 | Starting method of shunt, series and compound motors  | 1 |
| 24 | 22.03.23 |                          | Speed control of D.C shunt motors by Flux control method.<br>Armature voltage Control method.   | 1 |
| 25 | 23.03.23 |                          | Solve problems  | 1 |
| 26 | 24.03.23 |                          | Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method                            | 1 |
| 27 | 25.03.23 |                          | Determination of efficiency of D.C. Machine by Brake test method(solve numerical problems)  | 1 |
| 28 | 27.03.23 |                          | Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems)  | 1 |
| 29 | 29.03.23 |                          | Losses, efficiency and power stages of D.C. motor.  | 1 |
| 30 | 31.03.23 |                          | (solve numerical problems)  | 1 |
| 31 | 03.04.23 |                          | Uses of D.C. motors   | 1 |
| 32 | 05.04.23 | SINGLE PHASE Transformer | Working principle of transformer.   | 1 |
| 33 | 06.04.23 |                          | Constructional feature of Transformer, Arrangement of core & winding in different types of transformer.                                     | 1 |
| 34 | 08.04.23 |                          | Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc                                       | 1 |
| 35 | 10.04.23 |                          | Explain types of cooling methods  | 1 |
| 36 | 12.04.23 |                          | State the procedures for Care and maintenance.  | 1 |
| 37 | 13.04.23 |                          | EMF equation of transformer   | 1 |
| 38 | 15.04.23 |                          | Ideal transformer voltage transformation ratio  | 1 |
| 39 | 17.04.23 |                          | Operation of Transformer at no load, on load with phasordiagrams  | 1 |
| 40 | 19.04.23 |                          | Equivalent Resistance, Leakage Reactance and Impedance of transformer   | 1 |
| 41 | 20.04.23 |                          | To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load. | 1 |
| 42 | 21.04.23 |                          | To explain Equivalent circuit and solve numerical problems  | 1 |



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| 43 | 22.04.23 | SINGLE PHASE Transformer   | Approximate & exact voltage drop calculation of aTransformer.                           | 1   |
| 44 | 24.04.23 |  | Regulation of transformer.  | 1   |
| 45 | 26.04.23 |  | Different types of losses in a Transformer. Explain Open circuit and Short Circuit test | 1   |
| 46 | 27.04.23 |  | (Solve numerical problems)  | 1   |
| 47 | 28.04.23 |  | Explain Efficiency, efficiency at different loads and powerfactors                      | 1   |
| 48 | 29.04.23 |  | condition for maximum efficiency (solve problems)                                       | 1   |
| 49 | 01.05.23 |  | Explain All Day Efficiency (solve problems)   | 1   |
| 50 | 03.05.23 |  | Determination of load corresponding to Maximum efficiency.                              | 1   |
| 51 | 04.05.23 |  | 6 Parallel operation of single phase transformer.                                       | 1   |
| 52 | 06.05.23 |  | Auto Transformer  | 6 Parallel operation of single phase transformer. Continue. |
| 53 | 08.05.23 | Chapter 3 question discussion  |   | 1   |
| 54 | 10.05.23 | Constructional features of Auto transformer                                      |   | 1   |
| 55 | 11.05.23 | Working principle of single phase Auto Transformer                               |   | 1   |
| 56 | 12.05.23 | Comparison of Auto transformer with an two windingtransformer (saving of Copper) |   | 1   |
| 57 | 13.05.23 | Uses of Auto transformer   |   | 1   |
| 58 | 15.05.23 | Explain Tap changer with transformer (on load and off load condition)            |   | 1   |
| 59 | 17.05.23 | Chapter 4 question discussion  |   | 1   |
| 60 | 18.05.23 | Instrument transformer   | Explain Current Transformer and Potential Transformer                                   | 1   |
| 61 | 20.05.23 |  | Define Ratio error, Phase angle error, Burden.  | 1   |
| 62 | 22.05.23 |  | Uses of C.T. and P.T.   | 1   |
|    |          |  | TOTAL CLASS   | 62  |

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