GANDHI SCHOOL OF ENGINEERING

BHABANDHA,BERHAMPUR

BRANCH:- ELECTRICAL ENGINEERING

SEMESTER:- 4th

SUBJECT-:- EC-1

NAME OF FACULTY- Er. BISHNU PRASAD PANDA & Prof .T.C TRIPATHY

		Topic to be taken				Actual topictaken		
SL. No	**Topic/Module**	**No. of period**	**Details of the topics**	**Date**	**Topic No.**	**Topic Name**	**Date**	**Remarks**
1	**D.C GENERATOR**	**17**	1.1. Operating principle of generator 1.2. Constructional features of DC machine. 1.2.1. Yoke, Pole & field winding, Armature, Commutator. 1.2.2. Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch. 1.2.3. Simple Lap and wave winding, Dummy coils. 1.3. Different types of D.C. machines (Shunt, Series and Compound) 1.4. Derivation of EMF equation of DC generators. (Solve problems) 1.5. Losses and efficiency of DC generator. Condition for maximum efficiency and	**18.01.2024 TO 12.02.2024**	**1.1** **1.2** **1.2.1** **1.2.2** **1.2.3** **1.3** **1.4** **1.5** **1.6** **1.7** **1.7.1**	1.1. Operating principle of generator 1.2. Constructional features of DC machine. 1.2.1. Yoke, Pole & field winding, Armature, Commutator. 1.2.2. Armature winding, back pitch, Front pitch, Resultant pitch and commentator- pitch. 1.2.3. Simple Lap and wave winding, Dummy coils. 1.3. Different types of D.C. machines (Shunt, Series and Compound) 1.4. Derivation of EMF equation of DC generators. (Solve problems) 1.5. Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems. 1.6. Armature reaction in D.C. machine 1.7. Commutation and methods of improving commutation. 1.7.1. Role of inter poles and	18.01.2024 19.01.2024 20.01.2024 22.01.2024 24.01.2024 25.01.2024 31.01.2024 01.02.2024 02.02.2024 03.02.2024 05.02.2024 06.02.2024	

			numerical problems. 1.6. Armature reaction in D.C. machine 1.7. Commutation and methods of improving commutation. 1.7.1. Role of inter poles and compensating winding in commutation. 1.8. Characteristics of D.C. Generators 1.9. Application of different types of D.C. Generators. 1.10. Concept of critical resistance and critical speed of DC shunt generator 1.11. Conditions of Build-up of emf of DC generator. 1.12. Parallel operation of D.C. Generators. 1.13. Uses of D.C generators.		**1.8** **1.9** **1.10** **1.11** **1.12** **1.13**	compensating winding in commutation. 1.8. Characteristics of D.C. Generators 1.9. Application of different types of D.C. Generators. 1.10. Concept of critical resistance and critical speed of DC shunt generator 1.11. Conditions of Build-up of emf of DC generator. 1.12. Parallel operation of D.C. Generators. 1.13. Uses of D.C generators	07.02.2024 08.02.2024 09.02.2024 10.02.2024 12.02.2024	
2	**D. C. MOTORS**	**15**	2.1. Basic working principle of DC motor 2.2. Significance of back emf in D.C. Motor. 2.3. Voltage equation of D.C. Motor and condition for maximum power output(simple problems) 2.4. Derive torque equation (solve problems) 2.5. Characteristics of shunt, series and compound motors and their application.	**13.02.2024 TO 01.03.2024**	**2.1** **2.2** **2.3** **2.4** **2.5** **2.6**	2.1. Basic working principle of DC motor 2.2. Significance of back emf in D.C. Motor. 2.3. Voltage equation of D.C. Motor and condition for maximum power output(simple problems) 2.4. Derive torque equation (solve problems) 2.5. Characteristics of shunt, series and compound motors and their application. 2.6. Starting method of shunt, series and compound motors. 2.7. Speed control of D.C shunt motors	13.02.2024 15.022024 16.02.2024 17.02.2024 19.02.2024 20.02.2024 21.02.2024 22.02.2024 23.02.2024 24.02.2024 26.02.2024 27.02.2024 28.02.2024	

			2.6. Starting method of shunt, series and compound motors. 2.7. Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems 2.8. Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method 2.9. Determination of efficiency of D.C. Machine by Brake test method(solve numerical problems) 2.10. Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems) 2.11. Losses, efficiency and power stages of D.C. motor(solve numerical problems) 2.12. Uses of D.C. motors		**2.7** **2.8** **2.9** **2.10** **2.11** **2.12**	by Flux control method. Armature voltage Control method. Solve problems 2.8. Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method 2.9. Determination of efficiency of D.C. Machine by Brake test method(solve numerical problems) 2.10. Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems) 2.11. Losses, efficiency and power stages of D.C. motor(solve numerical problems) 2.12. Uses of D.C. motors	29.02.2024 01.03.2024	
3	**SINGLE PHASE TRANSFORMER**	**20**	3.1 Working principle of transformer. 3.2 Constructional feature of Transformer. 3.2.1 Arrangement of core & winding in different types of transformer. 3.2.2 Brief ideas about	**21.03.2024 TO 19.04.2024**	**3.1** **3.2** **3.2.1** **3.2.2**	3.1 Working principle of transformer. 3.2 Constructional feature of Transformer. 3.2.1 Arrangement of core & winding in different types of transformer. 3.2.2 Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc.	21.03.2024 22.03.2024 23.03.2024 27.03.2024 28.03.2024 30.03.2024 02.04.2024 03.04.2024	

			transformer accessories such as conservator, tank, breather, and explosion vent etc. 3.2.3 Explain types of cooling methods 3.3 State the procedures for Care and maintenance. 3.4 EMF equation of transformer. 3.5 Ideal transformer voltage transformation ratio 3.6 Operation of Transformer at no load, on load with phasor diagrams. 3.7 Equivalent Resistance, Leakage Reactance and Impedance of transformer. 3.8 To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load. 3.9 To explain Equivalent circuit and solve numerical problems. 3.10 Approximate & exact voltage drop calculation of a Transformer. 3.11 Regulation of transformer. 3.12 Different types of losses in a Transformer. Explain Open circuit and Short Circuit		**3.2.3** **3.3** **3.4** **3.5** **3.6** **3.7** **3.8** **3.9** **3.10** **3.11** **3.12** **3.13** **3.14**	3.2.3 Explain types of cooling methods 3.3 State the procedures for Care and maintenance. 3.4 EMF equation of transformer. 3.5 Ideal transformer voltage transformation ratio 3.6 Operation of Transformer at no load, on load with phasor diagrams. 3.7 Equivalent Resistance, Leakage Reactance and Impedance of transformer. 3.8 To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load. 3.9 To explain Equivalent circuit and solve numerical problems. 3.10 Approximate & exact voltage drop calculation of a Transformer. 3.11 Regulation of transformer. 3.12 Different types of losses in a Transformer. Explain Open circuit and Short Circuit test.(Solve numerical problems) 3.13 Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems) 3.14 Explain All Day Efficiency (solve problems)	04.04.2024 05.04.2024 06.04.2024 08.04.2024 09.04.2024 10.04.2024 12.04.2024 13.04.2024 15.04.2024 16.04.2024	

			test.(Solve numerical problems) 3.13 Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems) 3.14 Explain All Day Efficiency (solve problems) 3.15 Determination of load corresponding to Maximum efficiency. 3.16 Parallel operation of single phase transformer.		**3.15**	3.15 Determination of load corresponding to Maximum efficiency. 3.16 Parallel operation of single phase transformer.	18.04.2024 19.04.2024	
4	**AUTO TRANSFORMER**	**03**	4.1. Constructional features of Auto transformer. 4.2. Working principle of single phase Auto Transformer. 4.3. Comparison of Auto transformer with an two winding transformer (saving of Copper). 4.4. Uses of Auto transformer. 4.5. Explain Tap changer with transformer (on load and off load condition)	**20.04.2024 TO 23.04.2024**	**4.1** **4.2** **4.3** **4.4** **4.5**	4.1. Constructional features of Auto transformer. 4.2. Working principle of single phase Auto Transformer. 4.3. Comparison of Auto transformer with an two winding transformer (saving of Copper). 4.4. Uses of Auto transformer. 4.5. Explain Tap changer with transformer (on load and off load condition)	20.04.2024 22.04.2024 23.04.2024	

5	**INSTRUMENT TRANSFORMERS**	**05**	5.1 Explain Current Transformer and Potential Transformer 5.2 Define Ratio error, Phase angle error, Burden. 5.3 Uses of C.T. and P.T.	**24.04.2024 TO 27.04.2024**	**5.1** **5.2** **5.3**	5.1 Explain Current Transformer and Potential Transformer 5.2 Define Ratio error, Phase angle error, Burden. 5.3 Uses of C.T. and P.T.	24.04.2024 25.04.2024 26.04.2024 27.04.2024	

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