GANDHI SCHOOL OF ENGINEERING

BHABANDHA,BERHAMPUR

BRANCH:- ELECTRICAL ENGINEERING

SEMESTER:- 4th

SUBJECT-:- EC-1

NAME OF FACULTY-ER.BISHNU PRASAD PANDA, DR.TARINI CHARAN 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	**13.02.2023 TO 09.03.2023**	**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**	Operating principle of generator Constructional features of DC m Yoke, Pole & field winding, Armature, Commutator Armature winding, back pitch, Front pitch, Resultant pitch and commutator-pitch. Simple Lap and wave winding, Dummy coils. Different types of D.C. machines (Shunt, Series and Compound) Derivation of EMF equation of DC generators. (Solve problems) Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems. Armature reaction in D.C. machine Commutation and methods of improving commutation.	13.02.2023 14.02.2023 15.02.2023 16.02.2023 17.02.2023 20.02.2023 21.02.2023 22.02.2023 23.02.2023 24.02.2023 27.02.2023 28.02.2023	

			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 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**	Role of inter poles and compensating winding in commutation. Application of different types of D.C. Generators. Concept of critical resistance and critical speed of DC shunt generator Conditions of Build-up of EMF of DC generator. Parallel operation of D.C. Generators. Uses of D.C generators.	01.03.2023 02.03.2023 03.03.2023 04.03.2023 06.03.2023 09.03.2023	
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.	**10.03.2023 TO 03.04.2023**	**2.1** **2.2** **2.3** **2.4** **2.5** **2.6** **2.7**	Basic working principle of DC motor Significance of back emf in D.C. Motor. Voltage equation of D.C. Motor and condition for maximum power output(simple problems) Derive torque equation (solve problems) Characteristics of shunt, series and compound motors and their application. Starting method of shunt, series and compound motors. Speed control of D.C shunt motors by	10.03.2023 11.03.2023 13.03.2023 14.03.2023 15.03.2023 16.03.2023 17.03.2023 18.03.2023 20.03.2023 21.03.2023 22.03.2023	

			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		**2.8** **2.9** **2.10** **2.11** **2.12**	Flux control method. Armature voltage Control method. Solve problems Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method Determination of efficiency of D.C. Machine by Brake test method(solve numerical problems) Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems) Losses, efficiency and power stages of D.C. motor(solve numerical problems) Uses of D.C. motors	23.03.2023 24.03.2023 27.03.2023 28.03.2023 03.04.2023 03.04.2023	
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 transformer accessories such as conservator, tank, breather, and explosion vent etc.	**04.04.2023 TO 03.05.2023**	**3.1** **3.2** **3.2.1** **3.2.2** **3.2.3** **3.3** **3.4** **3.5** **3.6**	Working principle of transformer Constructional feature of Transformer. Arrangement of core & winding in different types of transformer. Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc. Explain types of cooling methods State the procedures for Care and maintenance. EMF equation of transformer.	04.04.2023 05.04.2023 06.04.2023 10.04.2023 11.04.2023	

			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		**3.7** **3.8** **3.9** **3.10** **3.11** **3.12** **3.13** **3.14** **3.15** **3.16**	Ideal transformer voltage transformation ratio Operation of Transformer at no load, on load with phasor diagrams. Equivalent Resistance, Leakage Reactance and Impedance of transformer To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load. To explain Equivalent circuit and solve numerical problems. Approximate & exact voltage drop calculation of a Transformer. Regulation of transformer. Different types of losses in a Transformer. Explain Open circuit and Short Circuit test.(Solve numerical problems) Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems) Explain All Day Efficiency (solve problems) Determination of load corresponding to Maximum efficiency. Parallel operation of single phase transformer.	12.04.2023 13.04.2023 17.04.2023 18.04.2023 19.04.2023 20.04.2023 21.04.2023 26.04.2023 27.04.2023 28.04.2023 29.04.2023 01.05.2023 02.05.2023 03.05.2023	

			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.					
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)	**04.05.2023 TO 10.05.2023**	**4.1** **4.2** **4.3** **4.4** **4.5**	Constructional features of Auto transformer. Working principle of single phase Auto Transformer. Comparison of Auto transformer with an two winding transformer (saving of Copper). Uses of Auto transformer. Explain Tap changer with transformer (on load and off load condition)	04.05.2023 05.05.2023 08.05.2023 09.05.2023 10.05.2023	
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.	**11.05.2023 TO 17.05.2023**	**5.1** **5.2** **5.3**	Explain Current Transformer and Potential Transformer Define Ratio error, Phase angle error, Burden. Uses of C.T. and P.T.	11.05.2023 12.05.2023 15.05.2023 16.05.2023 17.05.2023 18.05.2023	

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