

GOVERNMENT POLYTECHNIC ,BARGARH

Department Of Electrical Engineering

Semester: 4th. DIPLOMA

Subject: E.C-I

Branch: Electrical Engineering

Session: (Summer)

No of Period :75 (60 L+ 15 T)

Name of Faculty: NITESH KU. ACHARYA

Week	Period	Topics to be covered
1	1	D.C. GENERATOR: Operating principle of generator
	2	Constructional features of DC machine.
	3	Yoke, Pole & field winding, Armature, Commutator.
	4	Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch.
	5	Recall & discussion of class 1 to 4
2	6	Simple Lap and wave winding, Dummy coils.
	7	Different types of D.C. machines (Shunt, Series and Compound)
	8	Derivation of EMF equation of DC generators. (Solve problems)
	9	Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems.
	10	Recall & discussion of class 6 to 9
3	11	Armature reaction in D.C. machine
	12	Commutation and methods of improving commutation.
	13	Role of inter poles and compensating winding in commutation. Characteristics of D.C. Generators.
	14	Application of different types of D.C. Generators. Concept of critical resistance and critical speed of DC shunt generator
	15	Recall & discussion of class 11 to 14
	16	Conditions of Build-up of emf of DC generator.

4	17	Parallel operation of D.C. Generators Uses of D.C generators.
	18	D. C. MOTORS: Basic working principle of DC motor
	19	Significance of back emf in D.C. Motor.
	20	Recall & discussion of class 16 to 19
5	21	Voltage equation of D.C. Motor and condition for maximum power output (simple problems)
	22	Derive torque equation (solve problems)
	23	Characteristics of shunt, series and compound motors and their application.
	24	Starting method of shunt, series and compound motors.
	25	Recall & discussion of class 21 to 24
6	26	Speed control of D.C shunt motors by Flux control method. Armature voltage Control method.
	27	Solve problems of Speed control of D.C shunt motors.
	28	Determination of efficiency of D.C. Machine by Brake test method.
	29	solve numerical problems on determination of efficiency.
	30	Recall & discussion of class 26 to 29
7	31	Determination of efficiency of D.C. Machine by Swinburne's Test method.
	32	solve numerical problems of Swinburne's Test method.
	33	Losses, efficiency and power stages of D.C. motor.
	34	solve numerical problems on Losses, efficiency and power stages of D.C. motor. Uses of D.C. motors
	35	Recall & discussion of class 31 to 34
8	36	SINGLE PHASE TRANSFORMER: - Working principle of transformer. Constructional feature of Transformer.
	37	Arrangement of core & winding in different types of transformers.
	38	Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc.
	39	Explain types of cooling methods.

	40	Recall & discussion of class 36 to 39
9	41	State the procedures for Care and maintenance.
	42	EMF equation of transformer.
	43	Ideal transformer voltage transformation ratio.
	44	Operation of Transformer at no load, on load with phasor diagrams.
	45	Recall & discussion of class 41 to 44
10	46	Equivalent Resistance, Leakage Reactance and Impedance of transformer.
	47	To draw phasor diagram of transformer on load
	48	Phasor diagram of winding Resistance and Magnetic leakage with using unit pf, leading pf and lagging pf load.
	49	To explain Equivalent circuit and solve numerical problems.
	50	Recall & discussion of class 46 to 49
11	51	Approximate & exact voltage drop calculation of a Transformer.
	52	Regulation of transformer.
	53	Different types of losses in a Transformer.
	54	Explain Open circuit and Short Circuit test. (Solve numerical problems)
	55	Recall & discussion of class 51 to 54
12	56	Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency.
	57	solve problems on efficiency of transformer.
	58	Explain All Day Efficiency (solve problems).
	59	Determination of load corresponding to Maximum efficiency.
	60	Recall & discussion of class 56 to 59
13	61	Parallel operation of single-phase transformer.
	62	AUTO TRANSFORMER: Constructional features of Auto transformer.
	63	Working principle of single-phase Auto Transformer.
	64	Comparison of Auto transformer with a two-winding transformer.
	65	Recall & discussion of class 61 to 64
14	66	saving of Copper of Auto-transformer.
	67	Uses of Auto transformer.
	68	Explain Tap changer with transformer.
	69	On load and Off load Tap Changer.

	70	Recall & discussion of class 66 to 69
15	71	INSTRUMENT TRANSFORMERS: Explain Current Transformer and Potential Transformer.
	72	Define Ratio error, Phase angle error, Burden.
	73	Uses of C.T. and P.T.
	74	Discussion on C.T. & P.T.
	75	Recall & discussion of class 71 to 74