UNIT-I

DC GENERATORS

PART- A (SHORT ANSWER QUESTIONS)

S.No	Questions	BT	CO	PO
	Part – A (Short Answer Questions)			
1	Write Down The Emf Equation For D.C Generator.	BT2	CO1	PO1
2	State the functions of: a) Commutator b) Yoke c)Pole core in DC Generator.	BT1	CO1	PO1
3	Define MNA and GNA	BT2	CO1	PO1
4	Explain the dynamically induced E.M.F	BT2	CO1	PO1
5	Explain the purpose of inter pole in a D.C Generator.	BT3	CO1	PO2
6	A conductor of length 0.5 m, situated in at right angles to a uniform magnetic field of flux density 1.0 wb/m^2 moves with a velocity of 40 m/s . calculate the emf induced in the conductor. What will be the emf induced if the conductor moves at an angle 60 to the field?	BT3	CO1	PO2
7	List the different types of DC Generator	BT2	CO1	PO2
8	State the Flemming's right hand rule	BT2	CO1	PO1
9	Explain the constructional details of pole coil with a neat sketch	BT2	CO1	PO2
10	What is armature reaction. List different effects of it.	BT3	CO1	PO1
	Part – B (Long Answer Questions)			
a)	An 8 pole DC generator has 500 armature conductors, and a useful flux of 0.05wb per pole. What will be the E.M.F generated if it is lap connected and runs at 1200rpm? What must be the speed at which it is to be driven produce the same E.M.F if it is wave wound?	BT3	CO1	PO2
b)	Explain the working principle of DC generator using single loop generator.	BT2	CO1	PO2
a)	Explain in about detail about commutation of D.C machines.	BT4	CO1	PO2
b)	Derive the generated EMF in a DC Generator.	BT3	CO1	PO3
a)	Explain the process of commutation with neat diagrams and explain the methods of improvingcommutation.	BT3	CO1	PO2
b)	Explain the critical field resistance of a dc shunt generator	BT2	CO1	PO2
a)	Explain the construction of a DC machine with a neat sketch.	BT3	CO1	PO2
b)	Distinguish between Lap and Wave Windings.	BT3	CO1	PO3
a)	Explain the meaning of demagnetization and cross magnetization effects in a dc machine.	BT2	CO1	PO2
b)	Define the Critical speed of a DC Shunt generator.	BT3	CO1	PO2
	Explain the OCC, Internal and External characteristics of D.C Series generator.	BT2	CO1	PO2

UNIT-II

DC MOTOR

S.No		Questions	BT	CO	PO
Part – A (Short Answer Questions)					
1		Mention the various losses that occur in DC machines?	BT2	CO2	PO2
2		Explain the necessity of starter.	BT1	CO2	PO1
3		List the application of DC shunt Motor	BT3	CO2	PO2
4		Derive the expression for condition for maximum efficiency	BT3	CO2	PO2
5		Define critical field and critical speed of a d.c Generator	BT2	CO2	PO3
6		State the Flemming's Left hand rule	BT2	CO2	PO1
7		AD.C motor is connectd to a supply voltage of 460v as an aramature resistance 0.15 calculate the value of back emf when aramature current of 120A	BT1	CO2	PO1
8		What Is Back E.m.f Or Counter E.m.f	BT3	CO2	PO2
9		Mention The Methods For Starting An Induction Motor	BT3	CO2	PO2
10		Why Is Swinburne's Test Conducted.	BT2	CO2	PO3
Part – B (Long Answer Questions)					
11	a)	Derive the Torque equation of dc motor	BT3	CO2	PO2
	b)	Calculate the value of torque established by the armature of a 4pole motor having 774 conductors, two paths in parallel, 24 mwb flux per pole, when the total armature current is 50A	BT3	CO2	PO3
12	a)	Discuss about the types of losses of DC motor and derive the condition for maximumefficiency	BT3	CO2	PO2
	b)	A 440-v shunt motor has armature resistance of 0.8Ω and field resistance 200Ω ,determine the back e.m.f when the giving an output of 7.46KW at 85% of efficiency	BT3	CO2	PO2
13	a)	Explain the working principle of DC Shunt motor.	BT2	CO2	PO2
	b)	Explain Back EMF and its significance.	BT3	CO2	PO3
14	a)	Explain the speed control methods of DC shunt motor.	BT3	CO2	PO2
15	a)	Explain the construction and working of 3-point starter	BT3	CO2	PO2
		Draw the Mechanical characteristics of DC Compound motor.	BT2	CO2	PO2
16	a)	Explain in about detail about the effect of armature reaction of D.C machines.	BT2	CO2	PO3
	b)	A 25-kW, 250-DC shunt generator has armature and field resistance of 0.06Ω and 100Ω respectively. Determine the load armature power developed when working (i) as a generator delivering 25Kw output (ii) as a motor taking 25Kw	BT2	CO2	PO2

UNIT-III

TESTING OF DC MACHINES

S.No		Questions	BT	CO	PO
Part – A (Short Answer Questions)					
1		What are the Merits of Hopkinson's test?	BT1	CO3	PO1
2		Why is Swinburne's test preferred to determine the efficiency of a dc machine?	BT1	CO3	PO2
3		List different tests of DC Motor	BT2	CO3	PO2
4		State the any two advantages and dis advantages of brake test on different types of D.C Motors	BT2	CO3	PO2
5		What are the advantages and disadvantages of Swinburne's test	BT2	CO3	PO2
6		What are the disadvantages and of Hopkinson's test?	BT2	CO3	PO2
7		What are difference between Generator and Motor	BT2	CO3	PO2
8		In a brake test the effective load on the branch pulley was 381 der of the pulley 63.5 cm and speed 12 r.p.s. The motor took 49 A at 220 power and the efficiency at this load.	BT2	CO3	PO2
9		A200-V shunt motor develops an output of 17.158kWwhen taking 20.2kW the field resistance id 50Ω and aramature resistance 0.06Ωwhat is the efficiency and power input when the output is 7.46kW	BT3	CO3	PO2
10		In a Hopkinson's test on two 220-V 100 kW generators, the circulating current is equal to the full-load current and, in addition, 90 A are taken from the supply. Obtain the efficiency of each machine.	BT3	CO3	PO3
Part – B (Long Answer Questions)					
11	a)	Discuss in detail about Brake test on DC motor with neat sketch.	BT3	CO3	PO2
	b)	A 200 V DC shunt motor with armature and field resistances of 0.25 ohm and 200 ohm respectively, takes a no load current of 5 A. If it takes 50 A under loaded conditions, find its efficiency as generator.	BT3	CO3	PO3
12	a)	Explain briefly about the Retardation test?	BT3	CO3	PO2
	b)	With the help of neat sketch, explain the working of 4 point starter	BT2	CO3	PO1
13	a)	The Hopkinson test on two similar shunt machines gave the following data's line voltage =110V, line current 48A, Armature current 230A, field current 3A and 3.5A for motor and generator respectively. Armature resistance is 0.035 ohms. Calculate efficiency for both machines.	BT3	CO3	PO2
	b)	A 220-v,14.92kw dc shunt motor when tested by the Swinburne method gave the following results: Running light: armature current was 6.5 A and field current 2.2 A. With the armature locked. the current was 70 A when a potential difference of 3 V was applied to the brushes. Estimate the efficiency of the motor when working under full-load conditions.	BT3	CO3	PO2
14	a)	The no-load test of a 44.76kW, 220V, dc shunt motor gave the following data: Input current = 13.25A; Field current = 2.55A; Resistance of armature at 75^0 C = 0.032Ω andbrush drop = 2V. Estimate the full-load current and efficiency.	BT2	CO3	PO2
	b)	Discuss about the characteristics of DC series motor	BT2	CO3	PO2
15	a)	Explain the method of Swinburne's test on DC machine. With a neat sketch.	BT2	CO3	PO2

16	a)	Explain the method of Hopkinson's test on DC machine. With a neat sketch	BT3	CO3	PO2
	b)	In a brake test on dc shunt motor,the tensions on two sides of the brake were 2.9 kg ang 0.17kg .the radius of the pulley was 7cm. input current was 2amp at 230 volts.the motor speed was 1500 rpm. Find the torque,power-output and efficiency.	BT3	CO3	PO2

UNIT-IV

SINGLE PHASE TRANSFORMERS

PART- A (SHORT ANSWER QUESTIONS)

S.No	Questions	BT	CO	PO
	Part – A (Short Answer Questions)			
1	Mention the difference between core and shell type transformers.	BT1	CO4	PO1
2	What is the function of transformer oil in a transformer	BT2	CO4	PO2
3	What are the applications of step-up & step-down transformer	BT2	CO4	PO2
4	Define all day efficiency of a transformer.	BT2	CO4	PO2
5	Why transformers are rated in kVA	BT2	CO4	PO3
6	What is the purpose of laminating the core in a transformer	BT1	CO4	PO2
7	What are different losses occurring in a transformer	6 h o u r s - - a t n o l o a d	BT2	CO4 CO4 CO4
8	State some advantages of shell type transformer		BT2	CO4
9	What is meant by turns ratio in transformer?		BT1	
10	What is the function of a transformer?		BT2	CO4CO4
	Part – B (Long Answer Questions)			
11 a)	Explain the construction and principle of operation of single phase transformer		BT2	CO4CO4
11 b)	A transformer rated at a primary voltage 4,800 volts and a secondary voltage of 240 volts what is the turn's ratio		BT1	
12 a)	Derive the emf equation of the Transformer		BT2	
12 b)	A 25-kVA transformer has 500 turns on the primary and 50turns on the the secondary windings. the primary is connected is connected to 3000-V 50hz supply. Find the full load primary and secondary currents. The secondary emf and the maximum flux in the core. Neglect leakage drops and no-lod primary current.		BT2	CO4CO4
13 a)	Define Transformer? Explain its working, with neat circuit diagram.		BT1	CO4CO4
13 b)	A single phase transformer has 500 turns in the primary and 1200 turns in the secondary. The cross-sectional area of the core is 80 sq. cm. If the primary winding is connected to a 50 Hz supply at 500 V, calculate (i) Peak flux-density, and (ii) Voltage induced in the secondary .		BT3	
14 a)	What is voltage regulation of a transformer? Derive the conditions for maximum and zero voltage regulation in a transformer		BT2	
14 b)	Find All Day Efficiency of a transformer having maximum efficiency of 98% at 15KVA at unity power factor and loaded as follows: 12 hours --- 2KW at 0.5 P.F lag 6 hours --- 12KW at 0.8 P.F lag		BT2	

UNIT-V

TERSTING OF TRANSFORMERS AND POLY-PHASE TRANSFORMERSPART- A (SHORT ANSWER QUESTIONS)

S.No		Questions	BT	CO	PO
Part – A (Short Answer Questions)					
1		What are the advantages and disadvantages of Auto transformer.	BT2	CO5	PO2
2		A.3-phase 6,600/415-12.000-VA transformer has a per unit resistance of and a per unit leakage reactance of 0.1. Calculate the Ca loss and regulation at full-load 0.8p.f lag	BT2	CO5	PO2
3		A balanced 3-phase load of 150 kW at 1000 V, 0.866 lagging power factor is supplied from 2000 V, 3-phase mains through single-phase transformers (assumed to be ideal) connected in (i) delta-delta (ii) Vee-Vee. Find the current in the windings of each transformer and the power factor at which they operate in each case. Explain your calculations with circuit and sector diagrams.	BT1	CO5	PO3
4		What are the advantages poly phase transformer	BT1	CO5	PO2
5		What Is Single And Three Phase Transformer?	BT2	CO5	PO2
6		Where Is Core Type And Shell Type Construction Suitable For A Transformer	BT1	CO5	PO2
7		What Are Distribution Transformer?	BT2	CO5	PO2
8		Why Are Iron Losses Considered As Constant Losses In Transformer	BT2	CO5	PO1
9		What Are The Necessary Tests To Determine The Efficiency, Voltage Regulation, And Temperature Rise Of Winding & Insulation Of Transformer	BT2	CO5	PO2
10		What Is The Need For Parallel Operation Of Transformer?	BT3	CO5	PO2
Part – B (Long Answer Questions)					
11	a)	Is the sumpner's test data used for pre-determination of regulation of transformer? Justify the answer.	BT2	CO5	PO3
	b)	Explain the Equivalent circuit of an Auto Transformer.	BT2	CO5	PO2
12	a)	Explain about Auto transformer and the saving of copper in it.	BT1	CO5	PO2
	b)	Explain the Construction of 3 phase Transformer	BT2	CO5	PO2
13	a)	Differentiate between Two- winding transformer and Auto transformer.	BT1	CO5	PO2
	b)	Explain about all the types of three phase transformer connections.	BT3	CO5	PO2
14	a)	List out the conditions to operate two transformers in parallel.	BT2	CO5	PO1
	b)	Three number of single phase ideal transformers, each of rating 5 kVA, 200V/100V, 50 Hz is connected in star/delta fashion to supply a balanced three phase 10 kW, 0.8 power factor load at 100 V (line to line). Calculate line and phase currents on the secondary and primary sides	BT1	CO5	PO2
15	a)	Explain in detail about O.C and S.C test conducted on single phase transformer with neat sketch.	BT1	CO5	PO2
	b)	What is significance of Y-Y, Y-delta and Delta-Y, Delta-Delta connection in 3-phase transformers?	BT1	CO5	PO3

* **Blooms Taxonomy Level (BT)** (L1 – Remembering; L2 – Understanding; L3 – Applying;L4 –Analyzing; L5 – Evaluating; L6 – Creating