Course	B.E-Marine
Batch	16
Semester	III
Subject code	UBEE305
subject Name	Electrical Machines
PART-A	
	UNIT-1
1	State the principle of DC generators.
2	What is the function of yolk in a DC machine.
3	Give two reasons for failure of build up of e.m.f in DC shunt generator.
4	Name the various methods of decreasing the effects of armature reaction.
5	Write the emf equation of dc machine.
6	What is meant by armature reaction.
7	What are the various methods of improving commutation.
8	Define interpole.
9	What is the purpose of brush.
10	What are the necessary conditions for the generators to be self excited.
11	What are the effects of armature flux on the main flux.
12	What is the purpose of fuse?
13	How is satisfactory commutation achieved in non-inter polar machines?
14	What are the conditions to be fulfilled for a d.c shunt generator to build up emf?
15	What are the two functions of a commutator in d.c machines.
16	The series field winding has low resistance while the shunt field winding has high resistance. Why?
17	What are the arrangements to be done for satisfactory parallel operation of dc series generator.
18	Mention an application of a differentially compound generator.
19	What are the major parts of a dc generator?
20	What is Commutator?
PART-B	
	UNIT-I
1	Explain the various methods of commutation.
2	Draw the performance characteristics of different types of dc generators.
3	Draw the circuit diagram for separately excited generators & self excited series generator
4	A 4 –Pole, wave wound generator has 40 slots & 10 conductors are placed per slot. Find the generated emf when the generator is driven at 1200 rpm and flux is 0.02 wb.
5	Explain the various methods of excitation of dc machines.
6	Explain the armature reaction in dc generator on no load and on load.
7	Discuss the phenomenon of commutation in dc machines.
8	Explain the effect of armature reaction in dc generator. How its demagnetizing & cross- magnetizing ampere turns are calculated.

9	Explain the load characteristics of different types of compound generators.
10	Two separately excited dc generators are connected in parallel. Discuss how they share a load.
11	Draw and explain the load characteristics of separately excited generators.
12	Draw and explain the magnetization characteristics and load characteristics of DC shunt motor.
13	Draw and explain the magnetization characteristics and load characteristics of DC series motor.
14	Explain the procedure for synchronizing two dc generators?
15	What are the required conditions for parallel operation of dc generators?
PART-C	
	UNIT-1
1	Explain the construction and working principle of D.C. generator with neat diagram.
2	Explain briefly about the separately and self excited DC generators.?
3	A long shunt compound generator delivers a load current of 50 A at 500 V and has armature, series field and shunt field resistances of 0.05Ω, 0.03Ω and 250Ω respectively. Calculate the armature current and the generated emf. Allow 1V per brush for contact drop
4	A 4 pole,lap wound long shunt compound generator has 1200 armature conductors.The armature,series and shunt field resistance are 0.1Ω,0.15Ωand 250Ω respectively.If the flux per pole is 0.075 Wb.Calculate the speed at which the machine should be driven so that it can deliver the load of 50kw at 500 V.Take overall voltage drop due to brush contact as 2 V.
5	Derive the emf equation of a D.C. generator
6	A Compound generator delivers a load current delivers a 50A at 500V.The armature resistance are 0.05 and series resistance are 0.03 and shunt field resistanceare 250.Find the induced emf ,if drop is 1V per brush.Neglect armature reation.Assume a) long Shunt b) Short Shunt
PART-A	
	UNIT-II
1	Define torque.
2	what are the types of dc motor?
3	State the Principle of DC motor.
4	Write the torque equation of DC motor.
5	What is back emf?
6	write the applications of dc series motor.
7	write the applications of dc shunt motor.
8	write the applications of dc Compound motor.
9	what are the types of dc Compound motor?
10	What is differential Compound motor?
11	What is cumulatively compound motor?
12	Write the speed equation of DC motor.
13	What is starter?
14	What are the functions of starter?
15	What are the types of DC motor starter?
16	What are the methods of speed control of DC motor?

17	What are the advantages of Armature Voltage Control method?
18	What are the advantages of flux Control method?
19	What are the advantages of Rheostatic Control method?
20	What are the disadvantages of Rheostatic Control method?
PART-B	
1	Draw and explain the Characteristics of DC Shunt motor.
2	Explain the Principle of operation of DC motor with diagram.
3	Draw and explain the Characteristics of DC Series motor.
4	Draw and explain the Characteristics of DC Compound motor.
5	Write short notes on (i)Armature Voltage Control Method (ii) Flux Control Method.
6	Explain about Four point starter with diagram.
7	Write Short notes on Rheostatic Control method of DC Shunt motor.
8	Write short notes on DC Compound motor .
9	Explain about necessity and functions of starter.
10	Write short notes on DC Shunt motor.
11	Write short notes on DC Series motor.
12	Draw and explain the mechanical characteristics of DC series and shunt motor
13	Explain Ward-Leonard method of speed control in DC motors.
14	Describe the procedure for paralleling two DC shunt generators and for transferring the load from one machine to the other.
15	Explain the process of commutation in a DC motor.
PART-C	
1	Determine the developed torque , Shaft torque and lost torque of a 220V,4 poles series motor with 800 Conductors wave connectd supplying a load of 8.2 KW by taking 45 A from the mains.The flux per pole is 25mWb and its armature resistance is 0.6Ω
2	Explain briefly about the types of dc motor.
3	Derive the torque equation of dc motor.
4	Explain in detail about the speed control of dc shunt motor.
5	A 14.92KW,230 V ,1150 rpm, 4 Pole DC Shunt motor has a total of 620 Conductors are arranged in two parallel paths yielding its armature resistance of 0.2 Ω .When it delivers rated power at rated speed , it draws a line current of 74.8 A anf field current of 3A.Calculate the a) flux per pole b)Torque developed c) Rotational loses d) Total losses expressed in percentage
6	Explain in detail about three point starter with neat diagram.
PART-A	
	UNIT-III
1	Define Transformer.
2	What are the two types of transformer based on no.of turns in the secondary?

3	What are the three types of transformer based on construction?
4	Why Transformer ratings are mentioned in KVA?
5	What are the two types of test in Transformer for Calculating losses?
6	What are the advantages of Auto transformer?
7	What is transformation ratio?
8	What is Step up transformer?
9	What is Step down transformer?
10	What are the two types of core loss?
11	Write the Emf equation of Transformer.
12	What are the advantages of three phase transformer over single phase transformer.
13	What is All day Efficiency?
14	What are the types of three phase tranformer connections?
15	Define Voltage regulation.
16	What is the condition for maximum efficiency in Transformer?
17	Mention the difference between core and shell type transformers.
18	What are different losses occurring in a transformer?
19	What is the purpose of laminating the core in a transformer?
20	What are the typical uses of auto transformer?
PART-B	
1	Draw and explain the no load phasor diagram of a single phase transformer.
2	With the help of circuit diagrams, explain any two types of three phase transformer connections.
3	A 1000/100V, 10KVA transformer has 66 turns in the secondary. Calculate (i) primary turns (ii) primary and secondary full load current. Neglect the losses.
4	Write notes on the following i) auto transformers ii) 3phase transformers?
5	Derive the condition for maximum efficiency of a transformer.
6	write the advantages of autotransformer over ordinary transformer
7	Explain about Tranformer on load with diagram.
8	Explain about transformer on no load.
9	Explain about open circuit in transformer with necessary equations.
10	Explain about short circuit in transformer with necessary equations.
11	Explain the necessary conditions for Parallel operation of transformer.
12	Explain about star-star connection in 3phase transformer.
13	Explain briefly about the losses in a transformer.
14	Explain about delta-delta connection in 3phase transformer.
15	Explain about delta-wye connection in 3phase transformer.
PART-C	
1	Draw and explain the Construction and principle of operation of Transformer in detail.
2	Derive the emf equation of Transformer.

3	Explain in detail about Auto transformer.
4	Explain in detail about the equivalent Circuit of Transformer.
5	Explain the Parallel Operation of Single Phase Transformer.
6	A 20 KVA,2000/200 V,Single phase ,50 HZ transformer has a primary resistance of 2.5 Ω and reactance of 4.8 Ω .the secondary resistance and reactance are 0.01 Ω and 0.018 Ω respectively.find the i) Equivalent reactance referred to primary,(ii) Equivalent impedance referred to primary (iii) Equivalent resistance,reactance and impedance referred to secondary
PART-A	
	UNIT-IV
1	Define Slip.
2	State the Principle of Induction motor.
3	What are the types of three phase induction motor?
4	Define Synchronous speed.
5	Why Single phase induction motor is not self starting?
6	What are the types of Single phase induction motor?
7	Give the conditions for maximum torque for 3-phase induction motor?
8	Mention different types of speed control of rotor side in slip ring induction motor?
9	What are the advantages of 3-phase induction motor?
10	What does crawling of induction motor mean?
11	State the application of an induction generator?
12	Name the two windings of a single-phase induction motor
13	Give the names of three different types of single-phase motor.
14	State any four use of single-phase induction motor.
15	What are the types of starters in 3-phase induction motor?
16	What are the disadvantages of 3-phase induction motor?
17	What are the types of speed control from stator side of induction motor?
18	What is meant by plugging?
19	Why are induction motors called asynchronous?
20	What is meant by cogging?
PART-B	
1	Draw the slip-torque charactertics for a three-phase induction motor and explain.
2	A slip ring induction motor runs at 290 rpm at full load,when connected to 50hz supply.Determine the no. of poles and slip.
3	The stator of a 3-phase induction mottor has 3 slots per pole per phase.If supply frequency is 50 Hz.Calculate (i)Number of stator poles produced and total number of slots on the stator. (ii)speed of the rotating stator flux (or magnetic field).
4	Write short notes on crawling?
5	Differentiate between squirel cage and slip ring induction motor.
6	Name the different types of starters used for a 3 phase Induction motor?

7	State the principle of operation of three phase Induction Motor.
8	Compare single cage and double cage induction motor.
9	Compare squirrel cage rotor and slip ring rotor.
10	What are the advantages of slip-ring induction motor over cage Induction motor?
11	Write short notes on plugging and Regenerative braking.
12	Explain briefly about DOL starter.
13	Explain briefly about star delta starter.
14	Explain briefly about Auto transformer starter.
15	Explain briefly about rotor resistance starter.
PART-C	
1	Explain any one method of speed control of three- phase induction motor.
2	Explain in detail autotransformer method of starting a squirrel cage induction motor.
3	Explain briefly about Types of braking?
4	Explain the principle of operation of 3-phase induction motor and explain how the rotating magnetic field is produced by three-phase currents?
5	Explain in detail about star-delta starter of a squirrel cage induction motor.
6	Explain in detail about rotor resistance starter of slipring induction motor.
PART-A	
	UNIT-V
1	What is hunting?
2	Write down the equation for frequency of emf induced in an alternator.
3	Why a 3-phase synchronous motor will always run at synchronous speed?
4	What is synchronous impedance?
5	What is synchronous condenser?
6	Write the applications of synchronous motor.
7	Why should an alternator run always in synchronous speed.
8	State any four advantages of rotating field and stationary armature.
9	Define pole pitch
10	Define slot angle.
11	What is a synchronous capacitor.
12	Write down the equation of power developed by synchronous motor.
13	Define pull – out torque in synchronous motor.
14	What are v-curves?
15	Mention the advantages of salient pole in synchronous motor.
16	What is a phase advancer?
17	What are the two types of synchronous generators?
18	Define pitch factor or coil span factor.
19	Define distribution factor as applied to alternator.
20	Write down the emf equation of an alternator.
PART-B	
1	Write short notes on damper winding.
2	Derive the power developed by synchronous motor.

3	Explain the method of starting of synchronous motor.
4	Write short notes on Hunting.
5	Write short notes on cogging.
6	Explain the procedure for parallel operation of alternator.
7	Write the difference between synchronous motor and induction motor.
8	Write briefly about the synchronous motor applications.
9	Write briefly about the construction of V curves.
10	Write briefly about Slient pole Synchrnous motor.
11	Write briefy about synchronous motor with different excitations.
12	Write briefly about power flow within a synchronous motor.
13	Derive the emf equation of an alternator.
14	Write short notes on synchronous reactance.
15	Write short notes on synchronous impedance methos.
PART-C	
1	Explain the construction and principle of operation of synchronous machines.
2	What is synchroscope? How it is used for synchronization of alternators.
3	Difference between salient and cylindrical type of rotor?
4	Write short notes on : (i) V–curves of synchronous motor. (ii) Synchronous condenser.?
5	A 100 kVA, 3000 V, 50 Hz 3 phase star connected alternator has an effective armature resistance of 0.2 Ω. the field current of 40 A produces a short circuit current of 200A and an open circuit emf of 1040 V. Calculate the full load voltage at 0.8 regulation at 0.8 p.f. lagging and 0.8 p.f. leading. Draw Phasor diagram.
6	Justify that the synchronous motor can be used to improve the power factor of the industrial plant?