c	A 6 pole, 3 phase, star connected alternator has an armature with 90 slots and 12 conductors per slot. If it revolves at 1000 rpm and flux per pole being 0.5 wb, Calculate the emf generated, if the winding factor is 0.97 and the coil is full pitched. Also calculate the line emf.	8	

PART B

3	a	Explain the characteristics of d.c. shunt motor.	9	L2 CO3
	b	Derive the emf equation of synchronous generator.	9	L2 CO3
	c	A shunt wound DC generator delivers 496A at 440V to load. The resistance of shunt field coil is 110 Ω and that of armature winding is 0.02 Ω. Calculate (i) EMF induced in the armature. (ii) Total power developed by the armature.	7	L2 CO3

OR

4	a	The field current in a dc shunt machine is 2A and the line current is 20A at 200 V. Calculate (i) The generated emf when working as generator. (ii) Torque in Nm when running at 1500 rpm as motor. Take the armature resistance as 0.5 ohm.	9	L2 CO3
	b	Explain the concept of rotating magnetic field and show that resultant flux remains same at different instants of time.	10	L2 CO2
	c	Compare squirrel cage and slip ring types of rotors of an induction motor.	6	L2 CO2

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CONTINUOUS INTERNAL EVALUATION - 3

Dept:EC	Sem / Div: 1ˢᵗ A/B/C	Sub: Basic Electrical Engineering	S Code: 18ELE13
Date: 8/4/21	Time:3:00– 4:30PM	Max Marks: 50	Elective: N

Note: Answer any 2 full questions, choosing one full question from each part.

QN	Questions	Marks	RBT	CO's
	PART A			
1 a	Draw a labeled diagram of the cross section of a DC generator. What are the essential functions of the field coils, armature, commutator and brushes ?	10	L2	CO3
b	An 8 pole, lap connected armature has 960 conductors, a flux of 40mWb per pole and a speed of 400 RPM. Calculate the emf generated. If the armature were wave connected at what speed must it be driven to generate 400V?	6	L2	CO3
c	Give the necessity of Starter. With a circuit diagram, explain the working of star-delta starter for a 3ϕ induction motor.	9	L2	CO2
	OR			
2 a	Obtain from first principles an expression for Torque developed in DC motor.	9	L2	CO3
b	A 4 pole, 3-phase induction motor operates from a supply whose frequency is 50 Hz. Calculate (i) Synchronous speed (ii) The speed of the rotor when the slip is 0.04 (iii) The frequency of the rotor current when the slip is 0.03 (iv) The frequency of the rotor current at standstill.	8	L2	CO2