

Enrolment Number: _____

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B. TECH MID SEM EXAMINATION
3RD SEMESTER
ACY-2022-23 (ODD SEM)

Subject Name (Code): Electrical Machines – I (203106203)

Branch: Electrical

Date: 04/08/2022

Time: 2.30 PM to 4.00 PM

Total Marks: 40

Sr. No.		Marks
Q.1	(A) One line Questions (1) A lap wound 4 pole dc motor has 460 conductors. Find the number of parallel paths between the conductors? (2) A magnetic pole face has a rectangular section having dimensions 200 mm by 100 mm. If the total flux emerging from the pole is 150 μ Wb, calculate the flux density. (3) Determine the magnetic field strength and the mmf required to produce a flux density of 0.25 T in an air gap of length 12 mm. (4) Define Faraday's First Law of Electromagnetic Induction. (5) Define magnetic field strength.	05
	(B) Explain Bio Savart Law	05
Q.2	Attempt any four(Short Questions)	12
	(1) Derive equation of EMF for DC generator.	
	(2) Show different parts of DC Machine in diagram.	
	(3) Write application of commutator.	
	(4) Show relation between electrical Power and torque in DC motor.	
	(5) Explain EMF commutation.	
Q.3	Attempt any two	08
	(1) Write energy balance equation for DC motor.	
	(2) Discuss instantaneous movement of armature for singly excited magnetic system.	
	(3) Derive equation of Wfld at no load condition for Doubly Excited Magnetic system.	
Q.4	(A) Explain Interaction between armature reaction flux and main field flux.	05
	(B) Draw 4 pole DC machine to show placing of compensating winding and explain it's application	05
	OR	
	(B) A mild steel ring has a radius of 50 mm and a cross sectional area of 400 mm ² . A current of 0.5 A flows in a coil wound uniformly around the ring and the flux produced is 0.1 mWb. If the relative permeability at this value of current is 200. Find (a) the reluctance of the mild steel and (b) the number of turns on the coil.	05