Reg. No.															

Question Paper Code	13353

M.E. / M.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024 (JAN - 2025)

First Semester

M.E. - Power Electronics and Drives

24PPEPC102 - ANALYSIS OF ELECTRICAL MACHINES

Regulations - 2024

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Compare between the leakage flux and fringing flux.	2	K2	CO1
2.	Define Field energy and Co energy.	2	K1	CO1
3.	What is the function of static reference frame in D.C motor analysis?	2	K1	CO2
4.	Outline the torque equations of shunt D.C. motors.	2	K2	CO2
5.	List the commonly used reference frame.	2	K1	CO3
6.	Define arbitrary reference frame.	2	K1	CO3
7.	Show with diagram the equivalent circuit of an induction motor.	2	K2	CO4
8.	Give the Park's Equation.	2	K1	CO4
9.	What is Kron's primitive machine?	2	K1	CO5
10.	Define equal area criterion.	2	K1	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a)	Illustrate the expression of force and torque of a single excited magnetic system in terms of stored energy.	13	K2	CO1
		OR			
	b)	Illustrate the voltage equation for winding inductance.	13	K2	CO1
12.	a)	Explain in detail with necessary waveforms, the dynamic performance of permanent magnet DC motor during sudden increase or decrease in load torque.	13	K2	CO2
		OR			
	b)	Explain the time domain block diagram and state equation for shunt connected D.C. Machine.	13	K2	CO2
13.	a)	Explain about transformation of inductive and capacitive element from stationary to arbitrary reference frame.	13	K2	CO3

OR

b) Explain three phase to two phase transformation. *13 K2 CO3*

14. a) Illustrate the Voltage equations of a three phase symmetrical induction machine in machine variables. *13 K2 CO4*

OR

b) Illustrate the torque equations of a three phase symmetrical induction machine in arbitrary reference frame variable. *13 K2 CO4*

15. a) Explain about the three phase synchronous machine and analysis of steady state operation. *13 K2 CO5*

OR

b) Explain in detail with necessary waveforms dynamic performance of synchronous machine for load torque variations. *13 K2 CO5*

PART - C (1 × 15 = 15 Marks)

16. a) i) outline the analysis of dynamic performance for load torque variations in induction machines *10 K2 CO4*

ii) Infer the reason for two phase quantities appear as constant quantities in synchronously rotating reference frame. *5 K2 CO5*

OR

b) i) Outline the equations for flux linkages in the two axis model in induction machine. *5 K2 CO4*

ii) Demonstrate the voltage equations using Park's equations for synchronous machine. *10 K2 CO5*