Reg. No.												

Question Paper Code	12636

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Fourth Semester

Electronics and Instrumentation Engineering

(Common to Instrumentation and Control Engineering)

20EIPC401 - ELECTRICAL MACHINES

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Define Back emf in a D.C. Motor.	2	K1	CO1
2.	Which method is preferred for controlling the speed of DC shunt motor above the rated speed? Justify.	2	K2	CO1
3.	List out the merits and demerits of core and shell type transformer.	2	K1	CO2
4.	Why the transformer rated in KVA?Justify.	2	K2	CO2
5.	Why the 3-phase synchronous motor will always run at synchronous speed?	2	K1	CO3
6.	What does hunting of synchronous motor mean?	2	K1	CO3
7.	Define Pullout torque.	2	K1	CO4
8.	List the applications of 3-phase induction motor.	2	K1	CO4
9.	Discuss the double revolving field theory.	2	K1	CO5
10.	What is the principle of reluctance motor?	2	K1	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a)	With neat diagram explain the principle, construction and working of DC Motor and its characteristics.	13	K2	CO1
		OR			
	b)	Explain the different methods of excitation and characteristics of a DC Motors with suitable diagrams	13	K2	CO1
12.	a)	Explain the construction, working principle and operation of a transformer. Derive its emf equation.	13	K3	CO2
		OR			
	b)	A single phase transformer has 180 turns respectively in its secondary and primary windings. The respective resistances are 0.233 and 0.067. Calculate the equivalent resistance of (a) the primary in terms of the secondary winding (b) the secondary in terms of the primary winding (c) the total resistance of the transformer in terms of the primary.	13	K3	CO2

13.	a)	Draw the simplified equivalent circuit of synchronous motor and examine the effect of loading in synchronous motor at various power factors with help of phasor diagrams.	*13*	*K2*	*CO3*
		OR			
	b)	Illustrate the production of rotating magnetic field in two phase supply.	*13*	*K2*	*CO3*
14.	a)	Sketch and Explain the torque slip characteristics of 3 phase cage and slip-ring induction motors.	*13*	*K2*	*CO4*
		OR			
	b)	Describe the construction and working principle of 3 phase induction motor.	*13*	*K2*	*CO4*
15.	a)	Give the classification of single phase motors. Explain any two types of single phase induction motors.	*13*	*K2*	*CO5*
		OR			
	b)	Discuss the construction, operation and characteristics of the following: (i) Repulsion motor. (ii) Shaded Pole Motor.	*13*	*K2*	*CO5*

PART - C (1× 15 = 15 Marks)

16.	a) i)	Explain any 2 starting methods of three-phase induction motor.	*8*	*K2*	*CO4*
	ii)	Explain the construction and working principle of hysteresis motor.	*7*	*K2*	*CO5*
		OR			
	b) i)	Explain any one speed control of induction motor from stator side.	*8*	*K2*	*CO4*
	ii)	Explain the construction and working principle of Universal motor.	*7*	*K2*	*CO5*