24 JAN 2023

Reg. No.												

Question Paper Code	11671

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022

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.	Write down the power equation of a DC motor.	*2,K2,CO1*
2.	State the condition for maximum power in a DC motor.	*2,K1,CO1*
3.	Define transformation ratio of transformer.	*2,K1,CO2*
4.	Discuss why the Transformer ratings are in KVA.	*2,K2,CO2*
5.	Define voltage regulation.	*2,K2,CO3*
6.	Write the EMF equation of an alternator.	*2,K2,CO3*
7.	Mention the various methods used for starting a 3-phase induction motor.	*2,K2,CO4*
8.	Differentiate squirrel cage induction motor from slip ring induction motor.	*2,K2,CO4*
9.	State the use of shading coil in the shaded pole motor.	*2,K2,CO5*
10.	Name the type of single-phase motor used in ceiling fan.	*2,K2,CO5*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Explain briefly about the construction of DC generator with neat sketch.	*13,K2,CO1*
		OR	
	b)	A DC motor takes an armature current of 110A at 480V. The armature circuit resistance is 0.2Ω. The machine has 6 poles and the armature is lap connected with 864 conductors. The flux per pole is 0.05wb. Calculate (i) the speed (ii) the gross torque developed by the armature.	*13,K3,CO1*
12.	a)	Discuss in detail about the construction and types of transformer with neat sketch.	*13,K2,CO2*
		OR	

b) A Single-phase transformer has 400 primary and 1000 secondary turns. The net cross sectional area of the core is 60 cm^2. If the primary winding is connected to a 50-Hz supply at 520 V, Calculate (i) peak value of the flux density in the core (ii) the voltage induced in the secondary winding. *13,K3,CO2*

13. a) Explain V curves and Inverted V curves of Synchronous motor with a neat sketch. *13,K2,CO3*

OR

b) A three phase 16 pole alternator has a star connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03 weber sinusoidally distributed and the speed is 375 rpm. Determine the frequency and phase and line emf. Assume full pitched coil. *13,K2,CO3*

14. a) Enumerate various speed control methods for three-phase induction motor from stator side. *13,K2,CO4*

OR

b) Explain the torque -slip characteristics of a three-phase induction motor. *13,K2,CO4*

15. a) Explain in detail about capacitor start capacitor run motor. *13,K2,CO5*

OR

b) Explain the double field revolving theory with neat diagram. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) With a neat diagram explain in detail about repulsion type motor and universal motor. *15,K3,CO6*

OR

b) With a neat diagram explain the working of BLDC motor. *15,K3,CO6*