Register Number:……..

KUMARAGURU college of technology
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B.E/B.TECH DEGREE EXAMINATIONS: APRIL /MAY 2024

(Regulation 2018)

Fourth Semester

MECHANICAL ENGINEERING

U18EEI4207**:** Electrical Drives and Control

COURSE OUTCOMES

CO1: Describe the construction, principle of operation and characteristics of DC motors.

CO2: Distinguish the construction and operation various types of induction motors.

CO3: Familiarize the speed control techniques for DC motor and induction motor.

CO4: Describe the construction and operation of special electrical machines.

CO5: Choose the suitable motor for specific application.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

1.	State Faraday's law of electromagnetic induction.	CO1	[K_1]
2.	Compare Brushless DC motor with Brushed DC motor.	CO1	[K_2]
3.	What is Transformer?	CO2	[K_1]
4.	Compare squirrel cage with slipring induction motor.	CO2	[K_2]
5.	Write the speed equations of DC motor.	CO3	[K_2]
6.	Name the four-quadrant operations of DC motor.	CO3	[K_1]
7.	What are the limitations of rotor resistance control of induction motor?	CO4	[K_1]
8.	Name the speed control methods of three phase induction motor.	CO4	[K_1]
9.	List the applications of DC shunt motor.	CO5	[K_3]
10.	Define step angle of stepper motor.	CO4	[K_3]

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

11.	a)	Illustrate the construction of DC generator and explain the functions of various parts of DC generator.	10	CO1	[K_2]
	b)	Describe the operation of DC motor which is used in lathe application.	6	CO5	[K_2]

12.	a)	Why is the single-phase induction motor not a self-starting machine? Explain this phenomenon using the double field revolving theory.	8	CO2	[K_2]
	b)	Discuss the operation of split phase induction motor with a neat diagram.	8	CO2	[K_2]
13.	a)	Draw the block diagram of an electric drive system and discuss the functions of basic components of the drive system.	8	CO3	[K_2]
	b)	Outline the operation of single phase fully controlled converter fed speed control method of DC shunt motor.	8	CO3	[K_3]
14.	a)	Describe the Stator voltage control method using SCR based voltage controller for speed control in induction motors.	12	CO3	[K_2]
	b)	Write a short note on constant V/F ratio control method using Voltage Source Inverter (VSI) for speed control in induction motors.	4	CO3	[K_2]
15.		Discuss the construction, operation and applications of Variable Reluctance (VR) stepper motor.	16	CO4	[K_3]
16.	a)	Derive the expression for Torque developed in a DC motor.	6	CO1	[K_3]
	b)	Explain the construction and working of Brushless DC motor (BLDC).	10	CO4	[K_2]

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