U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

July / August 2024 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: Electrical and Electronics Engineering **Duration: 3 hrs.**
Course Code: 19EE4PCMC1 **Max Marks: 100**
Course: Electrical Machines - I

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		With relevant phasor diagrams, explain the operation of a practical single phase transformer under no load condition.	CO1	*PO8, 9,12*	**07**
	b)		Discuss, Equivalent circuit diagram of transformer resistance and leakage reactance with vector diagrams.	CO1	*PO8, 9,12*	**07**
	c)		Draw and explain the Connection diagram of Y- Δ & Δ-Δ connected three-phase transformer.	CO1	*PO8, 9,12*	**06**
			OR			
2	a)		The results obtained from open circuit and short circuit tests on 5 kVA, 500 / 250 V, 50 Hz, single phase transformer gave the following readings, O.C. Test: 500 V, 1 A, 50 W (L.V. side open) S.C. Test: 25 V, 10A, 60 W (L.V. side shorted) Compute: (i) The efficiency on full load, 0.8 lagging P.F (ii) The voltage regulation at full load, 0.8 leading p.f.	CO1	*PO8, 9,12*	**10**
	b)		State the advantages of single 3- phase unit transformer over bank of single phase transformers	CO1	*PO8, 9,12*	**05**
	c)		Draw the Connection diagram of open delta connected three-phase transformer.	CO1	*PO8, 9,12*	**05**
			UNIT - II			
3	a)		Compare a Two-winding transformer with Auto transformer in detail.	CO2	*PO8, 9,12*	**06**
	b)		Describe with phasor, the Parallel operation of transformers with equal voltage ratios.	CO2	*PO8, 9,12*	**06**
	c)		Explain the procedure for conducting Sumpner's test along with all precautions to be taken while conducting the test with neat diagram.	CO2	*PO8, 9,12*	**08**

			UNIT - III			
	4	a)	For a 4 pole, 3 phase, 50 Hz Induction motor ratio of stator to rotor turns is 2. On a certain load, its speed is obtained to be 1455 rpm. When connected to 415 V supply. Calculate, (i) Frequency of rotor emf in running condition. ii) Magnitude of induced emf in the rotor at standstill.	CO3	*PO8, 9,12*	**10**
		b)	Explain the Torque-Slip and Torque Speed characteristics of an 3-phase Induction motor	CO3	*PO8, 9,12*	**10**
			OR			
	5	a)	A 24 pole, 50 Hz, star connected induction motor has rotor resistance of 0.016 Ω per phase and rotor reactance of 0.265 Ω per phase at standstill. It is achieving its full load torque at a speed of 247 rpm. Calculate the ratio of (i) full load torque to maximum torque. ii) Starting torque to maximum torque	CO3	*PO8, 9,12*	**10**
		b)	List out the types of starters used for starting of 3 – phase induction motors. Explain any one method in detail.	CO3	*PO8, 9,12*	**10**
			UNIT - IV			
	6	a)	Explain no load tests and blocked rotor tests for an 3-phase induction motor.	CO4	*PO8, 9,12*	**10**
		b)	List out the factors affecting the performance of three phase induction motor.	CO4	*PO8, 9,12*	**10**
			UNIT - V			
	7	a)	Name the types single phase Induction motor. Explain Split-phase starting methods of single induction motor.	CO4	*PO8, 9,12*	**10**
		b)	Describe the construction and operating principle of single phase induction using double revolving field theory.	CO4	*PO8, 9,12*	**10**

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