Sanjay Ghodawat University, Kolhapur 2019-20

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017 EXM/P/09/01

Year and Program:2019-20 FY M.Tech **School of Technology** **Department of Electrical Engineering**

Course Code: ELE505 **Course Title: Modeling & Analysis of Electrical Machines.** **Semester – I**

Day and Date Wednesday 18/12/19 **End Semester Examination (ESE)** **Time:** 3 hr **Max Marks: 100** 10.30 am to 1-30 pm

Instructions:
1) All questions are compulsory.
2) Assume suitable data wherever necessary.
3) Figures to the right indicate full marks.

		Marks	Bloom's Level	CO
Q.1	**Solve any Two**			
a)	Develop expression of mutual inductances of armature winding in DC Shunt Machine.	07	L_5	CO1
	OR			
a)	Obtain the expression for instantaneous speed of DC motor and hence comment on transient behavior of motor for various disturbances.	07	L_5	CO1
b)	Describe and explain representation diagram of a basic two pole machine and primitive machines for DC Series motor.	08	L_4	CO2
	OR			
b)	Illustrate and explain representation diagram of a basic two pole machine and primitive machines for DC Shunt motor.	08	L_3	CO2
Q.2	**Solve any Two**			
a)	Discuss and derive the transformations for voltage and current between the rotating balanced three phase winding and a stationary two phase (d,q) winding.	07	L_5	CO3
	OR			
a)	Derive the transformations for currents between a rotating balanced three phase winding and (d,q,0) winding.	07	L_5	CO3
b)	Derive the transformations for currents between a rotating balanced three phase winding and (d,q,) winding in stator reference frame.	08	L_5	CO4

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OR

	b)	Write down the voltage and current equations of mathematical model of three phase induction machines and hence obtain an expression for steady state torque?	08	L_4	CO4
Q.3		**Solve any Two**			
	a)	From the basic two pole machines theory develop the voltage and torque equations of primitive machines. (i) Synchronous motor. (ii) Three phase induction motor.	08	L_5	CO1
	b)	Draw and explain representation diagram of a basic two pole machine and primitive machines for DC Compound motor.	08	L_5	CO2
	c)	Explain Park's transformation relating to the three phase currents of a Induction machine to its corresponding d-q axes currents.	08	L_5	CO3
	d)	Discuss modeling of three phase induction motor in rotor reference frame.	08	L_5	CO4
Q.4		**Solve any Two**			
	a)	Explain dynamic performance of induction motor under any one disturbance?	09	L_5	CO5
	b)	Derive voltage and torque equation of Induction machine and explain steady state analysis of induction machine.	09	L_6	CO5
	c)	Develop the generalized model of mathematical model of induction machines and hence derive steady state equations in phasor form.	09	L_6	CO5
Q.5		**Solve any Two**			
	a)	Discuss the transients in Magnetically coupled winding with finite leakage.	09	L_5	CO6
	b)	Discuss the transients in Magnetically coupled winding with no leakage.	09	L_5	CO6
	c)	Explain the algorithm for power flow of three phase Transformer for G-Yd Connections.	09	L_5	CO6

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Q.6	**Solve any Three**				
	a)	Explain Symmetrical Components Model of Three Phase Transformers.	06	L_4	CO5
	b)	Explain the algorithm for power flow of three phase Transformer for D-Gy Connections.	06	L_5	CO5
	c)	Describe Small displacement stability.	06	L_4	CO6
	d)	Describe Linearized model of Induction machines.	06	L_4	CO6

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