PRN:		Course Code :	ELE2502

Third Year **B. Tech** End Semester Examination Summer 2023

A C Machines

Day and Date: Wednesday, 14/06/2023 Max Marks: **100**

Time : 10.30 am to 1.30 pm Duration: **03** hrs

Instructions: All questions are compulsory.

			Marks	Bloom's Level	CLO
Q.1		**Attempt the following**			
	a)	State various methods used to start single phase induction motor. Explain double field revolving theory.	08	L1	CLO1
	b)	Draw constructional diagram and explain the working of capacitor run induction motor	08	L1	CLO1
		OR			
	b)	Draw the circuit diagram of a resistance start- induction run single phase induction motor and explain its working.	08	L2	CLO1
Q.2		**Attempt the following**			
	a)	Discuss the advantages of Rotating Field over Rotating Armature.	08	L2	CLO2
	b)	The effective resistance of a 2200 V, 50Hz, 440KVA, 1 phase alternator is 0.5 ohm. On short circuit, a field current of 40 A gives the full load current of 200A. The electromotive force on open circuit with same field excitation is 1160 V. calculate the synchronous impedance and reactance.	08	L4	CLO4
		OR			
	b)	A 3 phase, star-connected alternator supplies a load of 10MW at p.f 0.85 lagging and at 11KV (terminal voltage). Its resistance is 0.1 ohm per phase and synchronous reactance 0.66 ohm per phase . calculate the line value of emf generated.	08	L4	CLO4
Q.3		**Attempt any two from the following**			
	a)	Summarize synchronizing of alternators. List the conditions for parallel operation.	08	L3	CLO2
	b)	Define short circuit ratio of synchronous machine. State the significance of short circuit ratio	08	L2	CLO3
	c)	Explain various methods of synchronization of 3 phase alternator	08	L2	CLO3

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Q.4		**Attempt any two from the following**			
	a)	Justify synchronous motor is not self starting	08	L2	CLO1
	b)	Explain phasor diagrams of synchronous motors at different power factors.	08	L2	CLO2
	c)	Explain V & Inverted V curve of synchronous motor with experimental setup.	08	L2	CLO3
Q.5		**Attempt any Two of the following**			
	a)	Construct and Explain star-delta starter. State the necessity of starter in three phase induction motor.	09	L3	CLO3
	b)	Relate losses in three phase induction motor.	09	L3	CLO3
	c)	Explain the effect of change in rotor resistance on torque in three phase induction motor.	09	L3	CLO3
Q.6		**Attempt any Two of the following**			
	a)	Demonstrate step by step method to draw circle diagram of three phase induction motor. State the information obtained from circle diagram.	09	L3	CLO3
	b)	A 4 pole, 3 phase induction motor operates from a supply whose frequency is 50 Hz. Calculate: i) The speed at which the magnetic field of the stator is rotating. ii) The speed of the rotor when the slip is 0.04. iii) rotor frequency when it runs at 600 rpm	09	L5	CLO4
	c)	The result of no-load and blocked rotor test on a 400V, 36.8 Kw, 50Hz, 3-phase, 4-pole induction motor are as under: No-Lod test: 400 V, 30 A, 1800 W Blocked Rotor test: 110 V, 80 A, 4000W. The motor has a star connected stator having a resistance of 0.1 ohm/phase. Draw the circle diagram and evaluate: i) full load stator current. ii) full load power factor. iii) full load slip.	09	L5	CLO4

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