

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VI EXAMINATION – WINTER 2025****Subject Code:3150910****Date:19-11-2025****Subject Name:Electrical Machine- II****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Explain term hunting for synchronous motor	03
	(b) Draw and explain the phasor diagram of 3-phase alternator with unity and lagging power factor load.	04
	(c) Derive the equation of electromagnetic torque for a three phase induction motor. Also obtain the condition for maximum torque.	07
Q.2	(a) Explain power stages of an induction motor in detail	03
	(b) Explain double field revolving theory for single phase Induction Motor.	04
	(c) Explain necessity of starters in three induction motor also draw and explain auto transformer starter in detail.	07
OR		
	(c) List out different methods of speed control of Induction Motor. Explain any one in detail.	07
Q.3	(a) Define pitch factor and distribution factor.	03
	(b) Give comparison between salient pole and cylindrical type alternator	04
	(c) Following test results are obtained from a 3 phase, 6000 kVA, 6600V, star connected, 2 pole, 50 Hz turbo alternator: With a field current of 125 A, the open circuit voltage is 8000 V at the rated speed; with the same field current and rated speed, the short circuit current is 800 A. At the rated full load, the resistance drop is 3%. Find the regulation of the alternator on full load and at a power factor of 0.8 lagging. Draw vector diagram for lagging load.	07
OR		
Q.3	(a) Derive induced emf equation for alternator.	03
	(b) Explain construction and working of shaded pole single phase motor.	04
	(c) Define voltage regulation and explain zero power factor method in case of an alternator.	07
Q.4	(a) State advantages and applications of linear induction motor	03
	(b) Briefly explain V-curves of synchronous motor	04
	(c) What is synchronizing of an alternator? Explain all dark lamp method in detail.	07

OR

- Q.4** (a) State the conditions to be satisfied for parallel operation of 3 phase alternators. **03**
- (b) Explain cogging and crawling in Induction Motor. **04**
- (c) A synchronous motor absorbing 60 kW is connected in parallel with a factory load of 240 kW, having 0.8 lagging power factor. If the combined load has 0.9 lagging power factor, what value of leading KVAR will be supplied by synchronous motor & at what power factor is it working? **07**
- Q.5** (a) Write short note on Auto synchronous motor. **03**
- (b) Explain synchronous condenser and synchronous phase modifiers. **04**
- (c) Discuss working and applications of Permanent magnet brushless DC motor **07**
- OR**
- Q.5** (a) Explain construction and working of Repulsion motor. **03**
- (b) Explain slip test for measurement of direct and quadrature axis reactance for salient pole machine. **04**
- (c) Explain construction, working and advantages and disadvantages of switched reluctance motor. **07**
