

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– III (NEW) EXAMINATION – SUMMER 2022****Subject Code:3132407****Date:18-07-2022****Subject Name:Electrical Machines and Applications****Time:02:30 PM TO 05:00 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) Define the following terms: 1. Instrument Transformer 2. Current Transformer 3. Potential Transformer.	03
	(b) List the parts of DC Generator. Explain at least four in brief with necessary diagram and application.	04
	(c) Draw and Explain Power Flow Diagram for DC Generator and DC Motor.	07
Q.2	(a) Define the following terms: 1. All day efficiency 2. Efficiency curve 3. Slip	03
	(b) Discuss essential and desirable conditions to be satisfied for parallel operation of two 1- \emptyset transformers.	04
	(c) Define DC Motor. Explain the Classification of DC Motor with suitable diagram. Derive Torque equation of DC Motor.	07
OR		
	(c) Define Transformer. Explain the Classification of Transformer with Suitable diagram. Derive EMF Equation of Transformer.	07
Q.3	(a) What is SC Test? Explain the procedure to carry out SC Test.	03
	(b) Draw a on load Phasor diagram of a 1- \emptyset transformer and explain.	04
	(c) Explain necessity of starters. Explain 3-point starter for DC shunt motor with neat diagram.	07
OR		
Q.3	(a) What is OC Test? Explain the Procedure to Carry out OC Test.	03
	(b) Draw a no load Phasor diagram of a 1- \emptyset transformer and explain.	04
	(c) Explain necessity of starters. Explain 4-point starter for DC shunt motor with neat diagram.	07
Q.4	(a) What is Linear Induction motor? Explain in brief with its application.	03
	(b) Explain necessity of starters. Explain DOL starter for Induction Motor.	04
	(c) State and Explain Production of Rotating Magnetic Field for 3- \emptyset Induction motor.	07

OR

- Q.4** (a) Draw Slip Torque characteristic of 3 phase Induction motor and explain in brief. **03**
- (b) Explain necessity of starters. Explain Star Delta starter for Induction Motor. **04**
- (c) List the types of Single-Phase induction motor. Explain the operational principal of any one split phase induction motor with necessary sketch and vector diagram. **07**
- Q.5** (a) Derive the EMF equation of an alternator. **03**
- (b) Explain the construction and working of AC Servo motor. **04**
- (c) Mention the methods of determination of voltage regulation of an alternator. Describe the Synchronous impedance (EMF) method with necessary circuit and equation. **07**
- OR**
- Q.5** (a) Why synchronous motor is not self starting? Describe in brief. **03**
- (b) Explain the construction and working of DC Servo motor. **04**
- (c) Mention the methods of determination of voltage regulation of an alternator. Describe the Zero Power Factor (ZPF) method with necessary circuit and equation. **07**
