

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (NEW) EXAMINATION – SUMMER 2024****Subject Code:2131005****Date:04-07-2024****Subject Name: Electrical Machines****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) What are the advantages of salient pole type construction used for Synchronous machines?	03
	(b) Why almost all large size Synchronous machines are constructed with rotating field system type?	04
	(c) Explain the various techniques of speed control of 3-phase I M	07
Q.2	(a) Why do cylindrical Alternators operate with steam turbines?	03
	(b) State and explain the condition at which the starting torque developed in a slip-ring induction motor is maximum.	04
	(c) State and explain the double revolving field theory in single phase machine.	07
	OR	
	(c) Explain the process of building up of voltage in D.C shunt generator and give the conditions to be satisfied for voltage built-up.	07
Q.3	(a) How do the synchronizing lamps indicate the correctness of phase sequence between existing and incoming alternators?	03
	(b) What are the advantages of slip-ring I M over cage I M?	04
	(c) Explain the construction and working principle of a transformer.	07
	OR	
Q.3	(a) List the factors that affect the load sharing in parallel operating generators?	03
	(b) What are the losses occurring in an I M and on what factors do they depend?	04
	(c) Explain the various characteristics of DC motors.	07
Q.4	(a) What are the inherent characteristics of plain 1-phase Induction motor ?	03
	(b) Explain what is meant by synchronous watt.	04
	(c) Write short notes on different three-phase connection of a transformer	07
	OR	
Q.4	(a) What are the advantages and disadvantages of direct load test for 3 –phase I M?	03
	(b) How does the shaft torque differ from the torque developed in 3-phase Induction motor?	04
	(c) Where is an autotransformer employed in a power system? Why? Also explain its working principle with the help of diagrams.	07
Q.5	(a) How the synchronous motor can be used as s synchronous condenser?	03
	(b) What are the advantages and disadvantages of circle diagram method for predetermining the performance of 3 –phase I M?	04
	(c) Explain the features of a nuclear power plant with a suitable diagram	07
	OR	
Q.5	(a) Define load factor, diversity factor and plant utilization factor.	03
	(b) What are the various losses occurring in a transformer?	04
	(c) With the help of neat sketches explain different types of distribution systems	07
