

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III (NEW) EXAMINATION – WINTER 2023

Subject Code:2131005

Date:23-01-2024

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) Define : i) Plant utilization factor ii) Load factor iii) Diversity factor	03
	(b) Why the secondary terminal of CT should not be left open-circuited?	04
	(c) What is auto-transformer? Enlist its advantages & disadvantages over 2-winding transformer. Write its applications.	07
Q.2	(a) Discuss with necessary diagram sumpner's method of testing transformers.	07
	(b) Explain open circuit & short circuit tests on I-phase transformer.	07
	OR	
	(b) What is function of starter for induction motor ? Enlist starting methods of induction motor. Explain any one method in detail.	07
Q.3	(a) Compare squirrel cage & slip ring induction motor wrf to starting torque.	03
	(b) Draw & explain power stage of induction motor.	04
	(c) Draw & explain schematic diagram of Thermal Power station.	07
	OR	
Q.3	(a) Draw labeled diagram of 3 – point starter for DC Shunt motor.	03
	(b) Explain in brief Armature reaction in DC machine.	04
	(c) Define voltage regulation of alternator. Explain Synchronous impedance method for finding regulation in alternator.	07
Q.4	(a) Why synchronous motor is not self-starting ? Enlist self starting methods for synchronous motor.	03
	(b) Draw & explain torque slip curve for induction motor.	04
	(c) What is commutation in DC generator ? Explain in brief methods to improve poor commutation.	07
	OR	
Q.4	(a) Define back emf. Explain working principle of DC Motor.	03
	(b) Compare Salient pole & smooth cylindrical alternator.	04
	(c) Define Power factor. Enlist reasons for low power factor. Explain various power factor improvement methods in brief.	07
Q.5	(a) Why single phase induction motor is not self starting ?	03
	(b) Write a short note on Ferranti effect.	04
	(c) Explain 3-phase, 3-wire and 3-phase, 4-wire distribution system.	07

OR

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| Q.5 | (a) Justify : A dedicated single 3-phase transformer is more preferable than three 1-phase transformers. | 03 |
| | (b) Describe losses in transformer. | 04 |
| | (c) Explain schematic diagram of Nuclear Power station. Write precautions required to take care for disposal of nuclear waste. | 07 |
