

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III (NEW) EXAMINATION – SUMMER 2019

Subject Code: 2131005

Date: 18/06/2019

Subject Name: Electrical Machines

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.

			MARKS
Q.1	(a)	Explain working principle and derive the emf equation of single phase transformer.	03
	(b)	Explain the main parts of a D.C. machine with neat diagram.	04
	(c)	Explain different types of D C Generator according to its field winding.	07
Q.2	(a)	What is load factor, diversity factor and plant utilization factor?	03
	(b)	Explain power factor. How can we improve power factor?	04
	(c)	Explain open circuit and short circuit test on single phase transformer.	07
		OR	
	(c)	What is regulation of alternator. Explain ZPF method for finding regulation in alternator.	07
Q.3	(a)	Explain the losses of transformer. How these losses are reduce?	03
	(b)	What is need of starter in DC machine? Explain construction and working of three point starter.	04
	(c)	What is slip in induction motor? Explain torque/slip characteristics of induction motor.	07
		OR	
Q.3	(a)	Explain equipments used in a substation.	03
	(b)	What is the role of damper winding in (i) synchronous generator and (ii) synchronous motor?	04
	(c)	With help of phasor diagram explain the operation of practical transformer on load.	07
Q.4	(a)	Give comparison of squirrel cage and wound rotor motors.	03
	(b)	State types of single-phase induction motor and explain any one.	04
	(c)	Write advantages and application of auto transformer.	07
		OR	
Q.4	(a)	State advantages and disadvantages of hydro power plant.	03
	(b)	Explain the working principle of synchronous motor and state the methods of starting of synchronous motor.	04
	(c)	Explain scott connection in transformer.	07

- Q.5 (a) Write different starters used for 3 phase induction motor and explain any one of them. **03**
(b) Explain the Swinburne's test of a d.c. machine **04**
(c) Explain equivalent circuit of the single phase transformer. **07**
- OR**
- Q.5 (a) Draw and explain the internal & external characteristics of d.c. shunt generators. **03**
(b) Explain armature reaction of the d.c. machine. Give its remedies also. **04**
(c) Explain three phase four wire and three phase three wire AC system and merits of each. **07**

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