

**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.

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

- 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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