

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-III (OLD) EXAMINATION – WINTER 2021****Subject Code:131701****Date:23-02-2022****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.

			<b>MARKS</b>
<b>Q.1</b>	(a)	Explain working principle and derive the emf equation of single phase transformer.	<b>03</b>
	(b)	Explain equipments used in a substation.	<b>04</b>
	(c)	Explain open circuit and short circuit test on single phase transformer.	<b>07</b>
<b>Q.2</b>	(a)	What is load factor, diversity factor and plant utilization factor?	<b>03</b>
	(b)	Explain power factor. How can we improve power factor?	<b>04</b>
	(c)	Give difference between self excited and separately excited DC machine.	<b>07</b>
<b>OR</b>			
	(c)	With help of phasor diagram explain the operation of practical transformer on load.	<b>07</b>
<b>Q.3</b>	(a)	Explain the losses of transformer. How these losses are reduce?	<b>03</b>
	(b)	Explain various types of losses occurring in a d.c.generator.	<b>04</b>
	(c)	What is slip in induction motor? Explain torque/slip characteristics of induction motor.	<b>07</b>
<b>OR</b>			
<b>Q.3</b>	(a)	What do you mean of hunting in Synchronous Machine	<b>03</b>
	(b)	Explain commutation in DC machine.	<b>04</b>
	(c)	Explain steam power station with neat diagram.	<b>07</b>
<b>Q.4</b>	(a)	Explain the term 'Back emf' in respect to d.c.motor.	<b>03</b>
	(b)	Give comparison of squirrel cage and wound rotor motors.	<b>04</b>
	(c)	Explain synchronization of alternators. Which conditions must be satisfied for proper synchronization of 3-phase alternators?	<b>07</b>
<b>OR</b>			
<b>Q.4</b>	(a)	Write advantages and applications of auto transformer.	<b>03</b>
	(b)	Explain power stages of an induction motor.	<b>04</b>
	(c)	Write short note on classification of transmission line.	<b>07</b>
<b>Q.5</b>	(a)	Write different starters used for 3 phase induction motor and explain any one of them.	<b>03</b>
	(b)	Explain the Swinburne's test of a d.c. machine	<b>04</b>
	(c)	Explain equivalent circuit of the single phase transformer.	<b>07</b>
<b>OR</b>			
<b>Q.5</b>	(a)	Write a short note on Ferranti effect.	<b>03</b>

- (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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