Enrolment No.	Enro	lment	No.
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## **GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-III (New) EXAMINATION – WINTER 2015**

Subject Code:2130904 I Subject Name: DC Machines and Transformer			Date:05/01/2016	
Time: 2: Instruction	30pi	m to 5:00pm T	otal	Marks: 70
1. 2. 3.	Atte Mak Figu	mpt all questions. a suitable assumptions wherever necessary. ares to the right indicate full marks.		
				MARKS
Q.1		Short Questions		14
C	1	How eddy current losses can be minimized?		
	2	How can the direction of rotation of a dc motor be reversed?	?	
	3	What is commutation?		
	4	Can DC supply be applied to a transformer?		
	5	Draw torque v/s current characteristics for DC Series motor	•	
	6	What is the function of brushes in DC machine?		
	7	State various speed control method for DC series motor.		
	8	What is transformation ratio?		
	9 10	Draw phasor diagram for no load condition in transformer.		
	10	White applications of DC series motor		
	11 12	Define: Polo Pitch and coil spon		
	12	Which relay is used for the protection of transformer?		
	13 14	On what principle DC generator works?		
Q.2	(a)	Distinguish between singly excited and doubly exc magnetic systems.	ited	03
	<b>(b)</b>	Compare lap and wave winding.		04
	(c)	What is armature reaction? Explain the methods to overce the adverse effect of the armature reaction.	ome	07
	(c)	A 4-pole lap-wound d c shunt generator has a useful flux	per	07
	(0)	pole of 0.07Wb. The armature winding consists of 220 th each of 0.004 $\Omega$ resistance. Calculate the terminal voltage w running at 900 r.p.m. if the armature current is 50 A.	urns vhen	
Q.3	<b>(a)</b>	Why Secondary of current transformer should not be open?		03
	<b>(b)</b>	Explain the load characteristics of DC shunt generator.		04
	(c)	A shunt generator delivers 195 A at terminal voltage of 25	60V.	07
		The armature resistance and shunt field resistance are 0.0 and 50 $\Omega$ respectively. The iron and friction losses equal 950 Find: (a) EME generated (b) Cu losses (c) Output of the pr	)2Ω )W. rime	
		mover. (d) Commercial Mechanical and Electrical efficience	ries	
		OR		
Q.3	(a)	What is the necessity of starter in a DC motor?		03
	<b>(b)</b>	Explain 3 point starter for DC motor in brief.		04
	(c)	A 25 kW, 250V, d.c. shunt generator has armature and f resistances of 0.06 $\Omega$ and 100 $\Omega$ respectively. Determine total armature power developed when working	ield the	07

		(a) As a generator delivering 25 kW output and (b) as a	
		motor taking 25 kW input.	
Q.4	<b>(a)</b>	Derive the condition for maximum efficiency of a transformer.	03
	<b>(b</b> )	State various losses which take place in a transformer. On which factors do they depend?	04
	(c)	A 600 KVA, 1 phase transformer has an efficiency of 92% both at full load & half load at unity power factor. Determine	07
		its efficiency at 60% of full load at 0.8 power factor lag.	
		OR	
Q.4	<b>(a)</b>	Explain Scott connection in brief.	03
	<b>(b)</b>	Explain Sumpner's test for testing of a transformer.	04
	(c)	Discuss conditions for parallel operation of two 3-phase transformers.	07
Q.5	(a)	Explain the concept of ideal transformer.	03
-	<b>(b)</b>	Explain autotransformer as dimmer.	04
	(c)	Derive the expression for voltage regulation of a transformer on lagging & leading power factor loads.	07
		OR	
Q.5	<b>(a)</b>	Give the classification of DC generator.	03
	<b>(b)</b>	What are the advantages and disadvantages of Swinburne test?	04
	(c)	Explain O.C. and S.C. test on single phase transformer.	07

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