Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(New) EXAMINATION – SUMMER 2016

Subject Code:2130904 **Date:13/06/2016**

Subject Name:DC Machines and Transformer

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.**

			MARKS
Q.1		**Short Questions**	**14**
	1	Define doubly excited system. Give its example	
	2	Justify pole shoe of DC machine is larger than its body.	
	3	What is retarded commutation ?	
	4	Write the function of interpole in DC machine.	
	5	Why DC series motor can never be started on No-Load?	
	6	Define Back emf for DC Motor.	
	7	Why in DC machine brushes are made up of carbon?	
	8	Enlist various losses in transformer.	
	9	Explain why in transformer from No-load to full-load core losses remains constant?	
	10	Define all day efficiency of single phase transformer.	
	11	What is dimmer stat?	
	12	Define voltage regulation for single phase transformer.	
	13	Write disadvantages of bank of single phase transformer compare to three phase transformer.	
	14	Why CT secondary should never be kept open circuited ?	
Q.2	**(a)**	Draw and differentiate between long shunt & short shunt compound generator.	**03**
	(b)	A long shunt dynamo running at 1000rpm supplies 20KW at 220V and 85% efficiency. The resistance of shunt, series and armature windings are 0.04Ω, 110 Ω and 0.05 Ω respectively. Find Copper loss and Iron-friction loss.	**04**
	(c)	Draw the vector and winding diagram for the following 3-Ø transformer connections Dd0, Dd6, Dy11, Yd11.	**07**
		OR	
	(c)	Explain with circuit diagram use of CT & PT voltage, current and power measurement in single phase circuit.	**07**
Q.3	**(a)**	Define pitch factor. Write advantages of short pitched coil.	**03**
	(b)	Neatly sketch & explain the internal & external characteristics of a DC shunt generator.	**04**
	(c)	Explain process of commutation. Enlist different methods to improve commutation and explain any one method.	**07**
		OR	
Q.3	**(a)**	Write applications of DC shunt and series Motor.	**03**
	(b)	Enlist different speed control methods of DC shunt motor. Explain any one method.	**04**
	(c)	Explain the Swinburne's test on DC motor with circuit diagram.	**07**
Q.4	**(a)**	Derive condition for maximum efficiency for I - Ø transformer.	**03**

	(b)	The iron loss and full load copper loss of 100 KVA, 6600/400 Volts single phase transformer are 600W & 900W. Calculate the efficiency at full load and half load, at 0.8 pf lag.	**04**
	(c)	Explain open circuit and short circuit tests on I - Ø transformer.	**07**
		OR	
Q.4	**(a)**	Discuss the conditions to be satisfied before connecting two I - Ø transformers in parallel.	**03**
	(b)	Write comparison of autotransformer with two winding transformer.	**04**
	(c)	Explain sumpner's test on I - Ø transformer with diagram.	**07**
Q.5	**(a)**	Explain On Load Tap Changer for transformer.	**03**
	(b)	Explain Scott-connection of transformer in detail.	**04**
	(c)	Explain with diagram different cooling methods used for transformer.	**07**
		OR	
Q.5	**(a)**	Write application of Audio & Radio Frequency transformer.	**03**
	(b)	A single phase transformer with turn's ratio 2, delivers 10A, 220V to resistive load, while primary draws 6A at 0.9 pf lagging from 450V supply. Calculate efficiency and voltage regulation	**04**
	(c)	Write a short note on construction, working principle and applications of grounding transformer.	**07**

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