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GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– VI (New) EXAMINATION – WINTER 2019

Subject Code: 2160910   **Date: 12/12/2019**

Subject Name: Electrical Drives

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.**

Q.1	**(a)**	Explain factors affecting the selection of drive.	**03**
	(b)	Draw the basic block diagram of electric drives and Explain function of each block.	**04**
	(c)	What is electric drive? Advantages of electrical drive	**07**
Q.2	**(a)**	What is load equalization? Why is it needed?	**03**
	(b)	Derive the condition for steady state stability of the drive.	**04**
	(c)	Explain the single phase full-wave converter with RLE load and explain the operation for the firing angle beyond 90º.	**07**
		OR	
	(c)	Explain the four quadrant operation of chopper (type-E)	**07**
Q.3	**(a)**	Give comments on relation between carrier frequency and harmonic frequency for PWM inverters.	**03**
	(b)	Explain closed loop Current limit control of DC machine.	**04**
	(c)	Explain d-q model of induction motor with required derivations.	**07**
		OR	
Q.3	**(a)**	List advantages of PWM inverters	**03**
	(b)	What is the use of dynamic modeling of Induction motor?	**04**
	(c)	Explain the model referencing adaptive control (MARC) method.	**07**
Q.4	**(a)**	What is self tuning control? Explain	**03**
	(b)	Explain advantages of poly phase rectifier	**04**
	(c)	Explain regenerative braking control in chopper based DC drive	**07**
		OR	
Q.4	**(a)**	Explain Flux control method for speed control of DC shunt motor.	**03**
	(b)	What is sliding mode control? State its advantages	**04**
	(c)	Draw and explain torque-speed characteristics of DC shunt, PMDC and DC series motors	**07**
Q.5	**(a)**	Explain principle of vector control.	**03**
	(b)	State the advantages of electric traction drive	**04**
	(c)	Explain BLDC machine drive	**07**
		OR	
Q.5	**(a)**	List the applications of servo motor drives	**03**
	(b)	Explain basic structure of solar and battery powered drives.	**04**
	(c)	Explain requirements of traction drive.	**07**

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