Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2018

Subject Code:2160910 **Date:08/05/2018**

Subject Name:Electrical Drives

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.**

Q.1	**(a)**	Derive fundamental torque equation.	**03**
	(b)	Write advantages and disadvantage of electric drives	**04**
	(c)	Explain selection factors of electric drives.	**07**
Q.2	**(a)**	A motor is coupled to a load having the following characteristics. $T= 15 - 0.5\ \omega_m$ $T_L = 0.5\ \omega_m^2$ Find out the stable operating point for this combination.	**03**
	(b)	Explain characteristics of different types of load.	**04**
	(c)	Explain four quadrant operation of Electric drive using example of a cage.	**07**
		OR	
	(c)	Explain steady state and transient stability of an electrical drive.	**07**
Q.3	**(a)**	Draw and explain type-C chopper drive.	**03**
	(b)	Explain single phase dual converter.	**04**
	(c)	Explain model referencing adaptive control	**07**
		OR	
Q.3	**(a)**	Draw and explain type-D chopper drive.	**03**
	(b)	Explain closed loop Current limit control of DC machine.	**04**
	(c)	Explain self tuning control.	**07**
Q.4	**(a)**	Explain need of poly phase rectifier.	**03**
	(b)	Explain Shunted armature speed control of DC series motor.	**04**
	(c)	Explain single phase full bridge inverter with RL load	**07**
		OR	
Q.4	**(a)**	Explain advantages of poly phase rectifier.	**03**
	(b)	Explain Flux control method for speed control of DC shunt motor.	**04**
	(c)	Explain d-q model of induction motor with required derivations.	**07**
Q.5	**(a)**	Write relative merits and demerits of VSI and CSI.	**03**
	(b)	Write a short on solar and battery powered drives.	**04**
	(c)	Explain vector control of PMSM	**07**
		OR	
Q.5	**(a)**	Draw vector control model of Induction motor.	**03**
	(b)	Write a short note on servo motor drive requirement, control and implementation.	**04**
	(c)	Explain BLDC machine drive.	**07**

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