

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2017

Subject Code: 2160910

Date: 20/11/2017

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.

		MARKS
Q.1	(a) List advantages of Electric Drives.	03
	(b) Explain factors affecting the selection of drive.	04
	(c) Derive the equivalent value of drive parameters for loads with rotating motion and translational motion.	07
Q.2	(a) What is the meaning of stability of a drive? State the condition for steady state stability.	03
	(b) What is load equalization? Why is it required?	04
	(c) List components of load torques. Draw and explain torque speed characteristic of fan, high speed hoist, traction load and constant power loads.	07
	OR	
	(c) Explain the single phase full-wave converter with RLE load and explain the operation for the firing angle beyond 90° .	07
Q.3	(a) List advantages of PWM inverters	03
	(b) Explain class B chopper with necessary diagram.	04
	(c) Explain selective harmonic elimination technique for inverter.	07
	OR	
Q.3	(a) Give comments on relation between carrier frequency and harmonic frequency for PWM inverters.	03
	(b) Explain principle of dual converter with necessary diagram.	04
	(c) Explain three phase inverter with 180° conduction mode using necessary circuit and waveforms.	07
Q.4	(a) What is self-tuning control?	03
	(b) Why speed torque characteristic of PMDC motor is superior to conventional DC motor?	04
	(c) Explain model referencing adaptive control.	07
	OR	
Q.4	(a) Draw torque speed characteristic of different DC motors.	03
	(b) Draw and explain block diagram of close loop position control of DC motor.	04
	(c) Derive d-q model of Induction Motor in rotating reference frame.	07
Q.5	(a) What is the use of dynamic modelling of Induction motor?	03
	(b) Explain principle of vector control.	04
	(c) Write a short note on BLDC motor drives.	07
	OR	
Q.5	(a) List the applications of servo motor drives.	03
	(b) Explain requirements of traction drive.	04
	(c) Write a short note on solar power drives.	07
