Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (NEW) – • EXAMINATION – SUMMER 2016

Subject Code: 2722914 Date: 02/06/2016

Subject Name: Industrial Electronics & Control

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.**
4. **Notations/ symbols used have usual meanings.**

Q.1	**(a)**	Draw block diagram of on-line UPS system and explain its operation. Why battery backup is required in UPS system?	**08**
	(b)	Differentiate: (i) POWER TRANSISTOR ï POWER MOSFET. (ii) Induction Heating ï Dielectric Heating	**06**
Q.2	**(a)**	Discuss SMPS design for push-pull type topology.	**07**
	(b)	A copper conductor has a circular cross-section 5cms in diameter. Calculate the resistance per meter length of the cylinder at 10kHz.Assume conductivity of copper is 5.7×10^7 S/m.	**07**
		OR	
	(b)	Derive an expression for the power density for dielectric heaters.	**07**
Q.3	**(a)**	Draw detailed V-I characteristics of the SCR and explain the utility of Latching and Holding current.	**07**
	(b)	Describe operation of a sequence timer used for an automatic welding process.	**07**
		OR	
Q.3	**(a)**	Discuss electronic welding controls used in resistance welding.	**07**
	(b)	Explain switching characteristic of IGBT. State advantages of IGBT.	**07**
Q.4	**(a)**	Where variable - speed synchronous motors are used? Discuss performance of voltage source inverter drive with open loop control.	**07**
	(b)	Discuss the closed loop control ï PLL scheme to control DC motor	**07**
		OR	
Q.4	**(a)**	Explain stator voltage controller and draw the motor and load torque ï speed characteristics for voltage control.	**07**
	(b)	Discuss the control of DC motor using chopper.	**07**
Q.5	**(a)**	Write short note on: Use of SCRs in HVDC transmission	**07**
	(b)	Write short note on: Static circuit breaker.	**07**
		OR	
Q.5	**(a)**	Explain in brief- Battery operated vehicle.	**07**
	(b)	Write short note on: Servo Controlled Voltage stabilizer.	**07**

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