Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VIII.EXAMINATION – WINTER 2016

Subject Code: 181702 Date: 20/10/2016

Subject Name: Motion Control

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 construction of incremental encoder. How resolution of it can be increase explain it?	**07**
	(b)	Give difference between mechanical energy and power. Explain viscous friction, static friction and coulomb friction.	**07**
Q.2	**(a)**	Explain construction and waveforms of the resolver.	**07**
	(b)	Explain different applications of step motors.	**07**
		OR	
	(b)	Explain multiple stator stack VR step motors. Give its advantages and disadvantages as compare to single stator stack.	**07**
Q.3	**(a)**	Explain unidirectional and bidirectional 3-phase logic sequence circuit for the sep motors.	**07**
	(b)	What is the need of overdriving methods for step motors? List out all methods and explain dual voltage control.	**07**
		OR	
Q.3	**(a)**	Why suppression circuits are required for the step motors? Explain diode-resistance and zener diode suppression circuits with its load line.	**07**
	(b)	List out features of active suppression driver for step motors. Explain it with necessary voltage and current waveforms.	**07**
Q.4	**(a)**	Explain closed-loop control of step motor by current sensing.	**07**
	(b)	Discuss various selection criteria for the DC motors.	**07**
		OR	
Q.4	**(a)**	Explain variable unit time delay speed control of step motors.	**07**
	(b)	Explain the three body structure of torsional resonance.	**07**
Q.5	**(a)**	Explain bipolar DC motor PWM amplifiers.	**07**
	(b)	Explain linearized model using phase-locked servo systems.	**07**
		OR	
Q.5	**(a)**	State the design conditions of velocity control dc motor. Explain velocity control scheme with current amplifier.	**07**
	(b)	Explain different types of linear bidirectional dc servo amplifier operation.	**07**

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