Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII • EXAMINATION – SUMMER 2013

Subject Code: 180804 **Date: 09/05/2013**

Subject Name: Modeling and Simulation Techniques

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)**	Explain the graphical representation of a block that has states.	**07**
	(b)	Design a quadratic model.	**07**
Q.2	**(a)**	Specifying Simulation Accuracy/Speed Tradeoff parameters.	**07**
	(b)	Formulated to Solve Series RLC Using Resistor Voltage and inductive voltage with diagram.	**07**
		OR	
	(b)	Explain which are the components used in SimElectronics Libraries.	**07**
Q.3	**(a)**	Explain in detail of Modeling Dynamic Systems and Creating Models.	**07**
	(b)	Specifying Model Parameters for DC motor and Triangle Wave Generator.	**07**
		OR	
Q.3	**(a)**	Explain model of a DC motor driven by a constant input signal that approximates a pulse-width Modulated signal and look at the current and rotational motion at the motor output.	**07**
	(b)	Design model the equation that converts Celsius temperature to Fahrenheit.	**07**
Q.4	**(a)**	Write Quadratic Model Parameters.	**07**
	(b)	Explain Modeling Electronic Component. a).Parameterizing a Piecewise Linear Diode Model	**07**
		OR	
Q.4	**(a)**	Explain Modeling Electronic Component. a).Parameterizing an Exponential Diode from a SPICE Netlist	**07**
	(b)	Design and Building the Triangle Wave Generator Model.	**07**
Q.5	**(a)**	Design a RLC Circuit Simulink Model.	**07**
	(b)	A ball at 1200K is allowed to cool down in air at an ambient temperature of 300K. Assuming heat is lost only due to radiation, the differential equation for the temperature of the ball is given by $\frac{d\theta}{dt} \equiv -2.2067\times10^{-12}\left(\theta^{4}-81\times10^{8}\right)$ where is in K and in seconds. Find the temperature at $t = 480$ seconds using Runge-Kutta 2nd order method. Assume a step size of $h = 240$ seconds.	**07**
		OR	
Q.5	**(a)**	Which are the SimElectronics Additional Components/SPICE-Compatible Components?	**07**
	(b)	Explain and design a flow chart presents for Simscape simulation sequence.	**07**

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