

GUJARAT TECHNOLOGICAL UNIVERSITY**BE SEM-VIII Examination May 2012****Subject code: 180804****Subject Name: Modeling and Simulation Techniques****Date: 08/05/2012****Time: 10.30 am – 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)** **07**
1. Define different simulink software with example.
 2. Expand and Explain A Typical Simulink Model.
 3. Which are the simulation methods?
 4. Why do most of Simulation programming in MATLAB?
 5. Explain the Standard Block Libraries.
 6. Explain Zero-Crossing Detection in Simulating Dynamic Systems.
 7. In what ways Running a Time-Domain Simulation and Running a Small-Signal Frequency-Domain Analysis differ?
- (b)** List and explain the graphical representation of a block that has states. **07**
- Q.2 (a)** What is difference between Block Parameters, Tunable Parameters? Explain in detail. **07**
- (b)** Formulated to Solve Series RLC Using Resistor Voltage and inductive voltage with diagram. **07**
- OR**
- (b)** Explain system and subsystem. **07**
- Q.3 (a)** Describes Simulation Loop Phase. **07**
- (b)** What is Solvers? Explain in detail. **07**
- OR**
- Q.3 (a)** Explain Algebraic Loops, which techniques to use to eliminate an algebraic loop. **07**
- (b)** List the SimElectronics Libraries. **07**
- Q.4 (a)** How to develop a linear model for a DC motor, how to analyze this model under MATLAB and how to simulate the open-loop and closed-loop systems under SIMULINK. **07**
- (b)** Solving the state variables using differential equation. **07**
- OR**
- Q.4 (a)** Specifying Model Parameters for DC motor and Triangle Wave Generator. **07**
- (b)** Explain Parameterizing Blocks Piecewise Linear Diode Model. **07**
- Q.5 (a)** Draw and explain Triangle Wave Generator model. **07**
- (b)** Explain the Runge-Kutta 2nd and 4th order method. **07**
- OR**
- Q.5 (a)** 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 $\frac{d\theta}{dt} \equiv -2.2067 \times 10^{-12} (\theta^4 - 81 \times 10^8)$ where θ 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**

(b) Explain the process for Creating Models.

07
