Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 712106N Date: 30-12-2013

Subject Name: Modelling Simulation and Computer Application

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)**	Discuss system modelling and also classify it.	**07**
	(b)	Write shore note on image processing tool box of MAT LAB.	**07**
Q.2	**(a)**	Write short note on "MAT LAB" for modelling and simulation tools.	**07**
	(b)	Explain monte-carlo simulations system	**07**
		OR	
	(b)	State governing equation of open thermodynamic system and discuss any one of its.	**07**
Q.3	**(a)**	Write short note on simulink	**07**
	(b)	Explain computer technique for simulation application for small hydro project.	**07**
		OR	
Q.3	**(a)**	Write short note on various simulation software used in the field of mechanical engineering.	**07**
	(b)	What do you understand by static and dynamic system?	**07**
Q.4	**(a)**	Explain stochastic system with its examples.	**07**
	(b)	20% of the bolts produced in a factory are found to be defective. Find the probability that in a sample of 10 bolts chosen at random exactly 2 will be defective using (i) Binomial distribution (ii)Poisson distribution.	**07**
		OR	
Q.4	**(a)**	What do you understand linear and nonlinear systems of modelling?	**07**
	(b)	Discuss advantages and application of various simulation software used in the field of civil engineering.	**07**
Q.5	**(a)**	Explain linear feedback shift register.	**07**
	(b)	Model a printer belt drive system with an objective of determining the Effect of the belt spring constant "k". Assume the radius of the pulleys as r, the angular rotation of the motor shaft as θ and angular rotation of The driven pulley as θp. The mass of the printing device as m and its Position as y(t). A light sensor is used to measure y and the output of the Sensor is voltage V1= k1*y; where k1 is sensor constant. The controller Provides an output voltage V2 = - k1* k2 (dy/dt). Take J=(JMotor + JPulley), R as the field resistance, Km as motor constant and b as the motor-pulley Friction factor.	**07**
		OR	
Q.5	**(a)**	What is the import ant of modelling simulation systems in the field of engineering?	**07**
	(b)	Classify the combustion modelling of I.C. Engine and explain it.	**07**

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