Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – SUMMER 2016

Subject Code:170302 **Date:07/05/2016**

Subject Name:Physiological System Modelling

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)**	Discuss open loop and closed loop dynamics and show concern for control system.	**07**
	(b)	Discuss the physiological control system giving suitable example.	**07**
Q.2	**(a)**	Define the terms: intermediate variables, control variable, static model, dynamic model, linear model, lumped parameter model, distributed parameter model.	**07**
	(b)	Summarize the advantages and applications of MATLAB.	**07**
		OR	
	(b)	Discuss: development of computational fluid diagram of cardiovascular system.	**07**
Q.3	**(a)**	Draw a neat sketch to explain the neuromuscular reflex model for its transient response.	**07**
	(b)	Explain the terms: Overshoot and Gain, by taking suitable examples.	**07**
		OR	
Q.3	**(a)**	Write a note on: Wetheimer's saccade eye model.	**07**
	(b)	Differentiate between the control systems for physiology and engineering.	**07**
Q.4	**(a)**	Give the importance of simulation of pulmonary mechanics.	**07**
	(b)	Enlist the dependent and independent variables while framing models for lung mechanics. Name the model.	**07**
		OR	
Q.4	**(a)**	Enlist the MATLAB tools applied for glucose regulation model.	**07**
	(b)	Write a note on: respiratory control under closed loop conditions.	**07**
Q.5	**(a)**	Discuss the Nyquist criteria for stability in control system.	**07**
	(b)	What signifies the interface of pulmonary and cardiovascular models?	**07**
		OR	
Q.5	**(a)**	Briefly summarize the problems in parameter estimation while simulation.	**07**
	(b)	Discuss a model of circulatory control. State the behavior of dependent variables clearly.	**07**

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