B. TECH.

(SEM. VI) EXAMINATION, 2006-07

PHYSIOLOGICAL CONTROL SYSTEM & MODELLING

Time : 3 Hours] [Total Marks : 100

Note : Attempt all questions.

1  Attempt any four parts of the following : 5×4
   (a) Differentiate between distributed parameter models and lumped parameter models.
   (b) Differentiate between open loop and closed loop systems.
   (c) Where is the principle of super position applicable in physiological control system
   (d) Write a short note on physiological control system with an example.
   (e) Which are the linear models of physiological systems?
   (f) Explain the need for modelling physiological systems.

2  Attempt any four parts of the following : 5×4
   (a) Describe iron wire model in detail.
   (b) What are the steps involved in development of circulating model.

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(c) Describe the simulation technique of cardiovascular model.
(d) Explain the cardiac system with computational flow diagram.
(e) Write an algorithm to develop heart model.
(f) Cardiovascular is open loop system. Illustrate this statement for true or false.

3 Attempt any two parts of the following: 10×2
(a) Explain in detail computational flow diagram for cardiopulmonary model development.
(b) Explain in detail full model of pulmonary mechanics.
(c) Describe lung tissue visco elastance.

4 Attempt any two parts of the following: 10×2
(a) Describe in detail oculometer muscle model.
(b) Describe in detail linear muscle model.
(c) Describe four eye movements and quantitative eye movement model or Robinson's model.

5 Attempt any four parts of the following: 5×4
(a) Explain electrical model of thermoregulatory system
(b) Explain two control mechanisms of neuromuscular system.
(c) Describe the steady state analysis of muscle stretch reflex action.
(d) Write a note on ventilator control action.
(e) Describe frequency domain analysis of linearised model of lungs mechanics.
(f) Explain glucose insulin regulation model.