

B.TECH SEM – VIII (2007 COURSE) (BIOMEDICAL ENGG.)
: WINTER - 2017
SUBJECT : BIOMEDICAL MODELING OPTIMIZATION

Day : Monday
Date : 20/11/2017

W-2017-2703

Time 02.30 PM TO 05.30 PM
Max. Marks : 80

N.B.

- 1) **Q.1 and Q.5 are COMPULSORY.** Out of the remaining attempt any **TWO** questions from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer book.
- 4) Assume suitable data if necessary.

SECTION – I

- Q.1**
- a) How the regulation of acid-base balance is done? What are the strong acids and bases? (05)
 - b) Draw and explain circulatory system model? (05)
 - c) List basic biophysics tools with equation. (04)
- Q.2**
- a) Draw the diagram of Pancreatic cells which helps in regulating blood glucose and explain the mechanism of blood sugar control. (07)
 - b) Explain the thermodynamics of the body and how the body temperature is regulated? (06)
- Q.3**
- a) Differentiate between lumped and distributed parameter model. (07)
 - b) What is an importance of linear modeling? Explain it with suitable example. (06)
- Q.4**
- a) Describe voltage across membrane with the help of neat sketch. (07)
 - b) Derive an expression for ion pumps on the cell membrane. (06)

SECTION – II

- Q.5**
- a) What are the ways by which heat is lost from the body? (05)
 - b) Explain stretch reflex with simple block diagram. (05)
 - c) Write central neurophysiology of vision. (04)
- Q.6**
- a) Draw and explain the thermoregulatory plant model. (07)
 - b) Explain controller model of thermoregulatory system. (06)
- Q.7**
- a) How agonist and antagonist muscles work in opposition with each other? Give example of each muscle. (07)
 - b) Write notes on: (06)
 - i) Parkinson's syndrome
 - ii) Muscle spindle
- Q.8**
- a) Explain in brief: (07)
 - i) Active state tension generator
 - ii) Force velocity relationshipin context to eye movement control system
 - b) List the pair of muscles used to control eye movement and explain function of each with diagram. (06)

* * *