Code No: RR411105 **Set No. 1**

IV B.Tech I Semester Regular Examinations, November 2005
PHYSIOLOGICAL SYSTEMS MODELLING
(Bio-Medical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the need for modeling? [8]
   (b) Explain about different types of models? [8]
2. (a) Regarding endocrine systems explain the transport process by fluid circulation? [8]
   (b) Explain the chemical reactions pertaining to endocrine systems. [8]
3. Develop the physiological model for the functioning of pancreas? [16]
4. Distinguish between compartmental and non compartmental models? [16]
5. (a) Explain Biological receptor with examples? [8]
   (b) Explain Adaptation by giving examples? [8]
6. By drawing proper schematics. Explain with Glucose insulin model to estimate insulin sensitivity? [16]
7. Explain the terms:
   (a) Model comparison [8]
   (b) Pharmaco model [8]
8. Write short notes on:
   (a) Statistical approach to modeling. [8]
   (b) Averaging approach to modeling. [8]

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Code No: RR411105 **Set No. 2**

IV B.Tech I Semester Regular Examinations, November 2005
PHYSIOLOGICAL SYSTEMS MODELLING
(Bio-Medical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe on what basis you classify the physiological models? [8]
   (b) With the help of a mathematical model explain a respiratory system? [8]
2. (a) Give an overview of metabolic systems? [8]
   (b) With signal flow diagram discuss on compartment models? [8]
3. Explain about global models with an example? [16]
4. Distinguish between compartmental and non compartmental models? [16]
5. (a) Explain Biological receptor with examples? [8]
   (b) Explain Adaptation by giving examples? [8]
6. By drawing proper schematics. Explain with Glucose insulin model to estimate insulin sensitivity? [16]
7. (a) Compare the glucose insulin model with that model of glucose utilization. [8]
   (b) What is insulin sensitivity index? Explain? [8]
8. Write short notes on:
   (a) Statistical approach to modeling. [8]
   (b) Averaging approach to modeling. [8]

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Code No: RR411105 **Set No. 3**

IV B.Tech I Semester Regular Examinations, November 2005
PHYSIOLOGICAL SYSTEMS MODELLING
(Bio-Medical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Describe the techniques of mathematical modeling used in physiological systems? [16]

2. (a) Discuss compartment? [8]
   (b) What do you mean by chemical reactions that take place with regard to metabolic system of their body? Explain? [8]

3. Write short notes on
   (a) Purpose of compartmental models. [8]
   (b) Global models [8]

4. (a) How do you represent the compartment and control system of models? Explain.
   (b) Explain in what way mathematical models represent in analyzing a certain physiological system? [8+8]

5. (a) What is the role of baro receptors in arterial blood pressure control? [8]
   (b) Explain how baro receptors exhibit proportional plus derivative control phenomenon [8]

6. With glucose insulin model. Estimate insulin sensitivity, discuss in detail? [16]

7. Write short notes on
   (a) Models of Glucose utilization [8]
   (b) Model comparison [8]

8. (a) With the help of necessary data explain a discrete statistical approach to a endocrine system modelling? [8]
   (b) Write short notes on discrete statistical signals? [8]

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Code No: RR411105 **Set No. 4**

IV B.Tech I Semester Regular Examinations, November 2005
PHYSIOLOGICAL SYSTEMS MODELLING
(Bio-Medical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe on what basis you classify the physiological models? [8]
   (b) With the help of a mathematical model explain a respiratory system? [8]
2. (a) With neat illustration, represent a mathematical model for any endocrine system?
   (b) Discuss the chemical reactions involved in a endocrine system? [8+8]
3. Explain about organ models with an example? [16]
4. Explain the different types of approaches to modeling? [16]
5. (a) Explain briefly transfer function models of receptors [8]
   (b) Distinguish between fast and slow adaptations of receptors? [8]
6. (a) Explain the need for model decomposition? [8]
   (b) Discuss how decomposition helps in the case study of insulin model? [8]
7. (a) Discuss any two omodels of glucose utilization [8]
   (b) Write short notes on insulin sensitivity index? [8]
8. (a) With the help of necessary data explain a descrete statistical approach to a metabolic system modeling? [8]
   (b) Write short notes on continous statistical signals? [8]

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