

Biological modeling & Simulation

QP Code : 6357

13

(3 Hours)

[Total Marks :80

- N.B. : (1) Question No. 1 is compulsory.
 (2) Attempt any three questions out of remaining five.
 (3) Figures to the right indicates full marks.
 (4) Assume data wherever necessary.

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| 1. (a) | How is thermogenesis different from thermolysis. | 5 |
| (b) | Explain with a neat diagram electrode electrolyte interface. | 5 |
| (c) | What is parallel conductance equation? | 5 |
| (d) | Differentiate between active- state tension and muscle tension. | 5 |
| 2. a) | With the help of neat diagram explain electrical model of cell membrane | 10 |
| b) | Explain different biophysics tools | 10 |
| 3. (a) | Derive cable equation | 12 |
| (b) | With the neat block diagram explain Thermoregulatory system. | 8 |
| 4. (a) | Explain the complete neuromuscular control system with all relevant blocks. | 12 |
| (b) | Explain all four eye movements. | 8 |
| 5. (a) | Derive equation for peak time and peak velocity for Weisthemer's model | 12 |
| (b) | Explain glucose insulin model | 8 |
| 6. (a) | Explain in detail complete immune system | 8 |
| (b) | What are glissades? | 4 |
| (c) | Explain Hodgkin Huxley's model with necessary equation | 8 |