2nd half (i+) 8

BMS Dec 11

Con. 6889-11. (REVISED COURSE MP–3613

(3 Hours) Total Marks : 100

Sem – VI (Biomedical) exam 5.14, 2011

(Biological Modelling & Simulation

24/12/11

N.B (1) Question No. 1 is Compulsory.
(2) Attempt any four questions out of remaining six.
(3) Figures on the right indicate full marks.
(4) Draw diagrams / sketches wherever necessary.
(5) Use legible handwriting. Use blue / black ink only.

Q.1.(a) Explain significance of ion pumps. [05]
(b) What are the industrial applications of thermoregulatory system ? [05]
(c) What are the different biophysics tools? [05]
(d) Differentiate between spindle receptor and golgi tendon. [05]

Q.2. (a) With reference to the thermoregulatory system explain the controller action for : [06]
(I) Low average skin and brain temperature.
(II) High average skin and brain temperature.
(b) Explain the above mentioned controller action if set points are different for shivering and sweating. [06]
(c) Explain with a neat diagram physiology of insulin-glucose feedback system. [08]

Q.3. (a) Explain two control mechanism neuromuscular system [10]
(b) Explain with a neat diagram sliding filament theory. [10]

Q.4. (a) Differentiate with suitable example – [10]
(i) Compartmental modelling and non-compartmental modelling
(ii) Lumped parameter and distributed parameter models.
(b) Draw the electrical model of a membrane and explain the physiological significance of each element. [10]

Q.5. (a) Explain with a neat diagram modelling of human immune response system. [10]
(b) Drive the expression for maximum displacement of the eye for Westheimer's model. [10]

Q.6. (a) Explain voltage clamp experiment with a neat diagram. How were the time courses of K+ and Na+ currents determined? [10]
(b) What is stretch reflex? Explain the closed loop neuromuscular control system showing anatomical connections between physiological components that participate in stretch reflex. [10]

Q.7. Write short notes on : [20]
(a) Glissades
(b) Circulatory system model
(c) Parameter Estimation
(d) Pharmacokinetics