

TE-VI-CBSCS-BM-May 2016.

B.M.S.

20/05/16

Q.P. Code : 724500

(3 Hours)

[Total Marks : 80]

- N.B. : (1) Q. No. 1 is compulsory.  
(2) Attempt any three from Q. No.2 to Q. No. 6  
(3) Figure to right indicates full marks

1. (a) Explain all four biophysics tools. 20  
(b) How is thermogenesis different from Thermolysis?  
(c) Differentiate between the function of spindle receptor and golgi tendon organ.  
(d) Explain the basic eye muscles and the various movement performed by them.
2. (a) Derive Nernst equation for a bivalent ion. 10  
(b) The following concentration values have been calculated for the gaint 10  
cell of the sea snail  
 $[Na]_o = 337mM$   
 $[Na]_i = 50 mM$   
 $[K]_o = 6mM$   
 $[K]_i = 168 mM$   
 $[Cl]_o = 340 mM$   
 $[Cl]_i = 41 mM,$   
For the resting cell membrane,  
 $P_K : P_{Na} : P_{Cl} = 1.0 : 0.019 : 0.381$   
What is the resting potential predicted by the Goldman equation? Assume  
temperature as  $27^\circ C$ .  
What would be the effect of a tenfold increase in the external potassium  
concentration on the resting membrane potential? Calculate the Nernst  
potential and draw a model for this cell.
3. (a) With the help of neat labeled diagram explain the electrical model of 10  
thermoregulatory plant.  
(b) What is a Core conductor Model? Derive the general Cable equation 10

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4. (a) Explain the two control mechanism using anatomical sketches in NMCS, Also explain the open loop and closed loop strategy of the same. 10
- (b) Derive an expression for peak time and peak velocity of Weisthemer's eye model. 10
5. (a) Explain in detail the immune system response model. 10
- (b) (i) How is compartmental model different from non- compartmental model? 10
- (ii) Define and differentiate between lumped and distributed model.
6. Write short notes on any four: 20
- (i) Glissades
  - (ii) Draw the experimental set up of Hodgkin Huxley's model
  - (iii) Cardiovascular system model
  - (iv) Giucose - Insulin Model
  - (v) Stretch reflex