

- (g) Which of the following signaling molecules are used by simple nerve reflexes?
- (i) Proteases
 - (ii) Nitric oxides
 - (iii) G proteins
 - (iv) Neurotransmitters
- (h) Which of the following statements is not true about G proteins?
- (i) G proteins are involved in signal cascades
 - (ii) G proteins become activated when bound to GDP
 - (iii) Guanine nucleotides regulate G proteins
 - (iv) None of the above
- (i) The visual acuity is measured by
- (i) Ishihara chart
 - (ii) Pie chart
 - (iii) Snellen chart
 - (iv) Jaeger chart
- (j) When light enters eye through pupil, maximum refraction occurs at
- (i) cornea
 - (ii) eye lens
 - (iii) vitreous humour
 - (iv) aqueous humour
- (k) Diacyl glycerol activates
- (i) Protein kinase A
 - (ii) Protein kinase C
 - (iii) MAP kinase
 - (iv) Tyrosine kinase
- (l) In the cAMP pathway the G protein stimulates
- (i) Phospholipase C
 - (ii) Adenylate cyclase
 - (iii) Jenus Kinase
 - (iv) Calmodulin
- (m) Which of the following acts as a molecular switch?
- (i) GPCR
 - (ii) G protein
 - (iii) CREB
 - (iv) All of these
- (n) Which of the following is a cell surface receptor?
- (i) Enzyme-linked receptors
 - (ii) G protein-linked receptors
 - (iii) Ion-channel linked receptors
 - (iv) All of these
- (o) Association constant of the ligand receptor binding for endocrine signaling is
- (i) Higher than neural signaling
 - (ii) Lower than neural signaling
 - (iii) Same as neural signaling
 - (iv) It cannot be measured

2. Answer any *ten* questions from the following:

2×10 = 20

- (a) Why is cAMP called a “second messenger”? Besides cAMP, which inorganic molecule acts as a second messenger?
- (b) Mention three major factors from which resting membrane potential arises.
- (c) Why may electrical synapses work in two directions, but chemical synapses can transmit a signal in only one direction?
- (d) What are the factors that affect the speed of propagation of a nerve impulse?

- (e) Name the exposed and transparent part of the eyeball. Contraction of which muscle adapts the lens for vision?
- (f) Explain the causes of colour blindness and night blindness (or nyctalopia).
- (g) What are the names of the two sacs that lie in the membranous labyrinth of the vestibules? Name the three chambers of cochlea.
- (h) Which structural aspects in the eyes make sparrows more active during day and not at night?
- (i) What is the role of G-proteins in cell-signaling?
- (j) Define Intensity level of sound.
- (k) What is meant by the power of accommodation of the human eye?
- (l) Which part of a neuron is responsible for receiving information?
- (m) What is the role of phosphatidyl inositol in signal transduction?
- (n) Explain Einthoven's law.
- (o) What is synaptic delay?

3. Answer any *two* questions from the following: 5×2 = 10
- (a) Briefly describe depolarizing and repolarizing phases depicting changes in ion flow through voltage-gated ion channels during the phases of action potential. 5
 - (b) How is G₀ stage different from G₁ phase? State the significance of S phase of Cell Cycle. 3+2
 - (c) What is the importance of myelin sheath around the axon? What are the nodes of ranvier? On what factors the speed of action potential depends? 2+1+2
 - (d) Write short notes on the following (any *two*): 2 $\frac{1}{2}$ × 2 = 5
 - (i) Gibbs-Donnan equilibrium
 - (ii) ECG
 - (iii) Synaptic conduction.

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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