



**WEST BENGAL STATE UNIVERSITY**  
B.Sc. Programme 5th Semester Examination, 2021-22

**MLBGDSE01T-MOLECULAR BIOLOGY (DSE1)**

**FUNDAMENTALS OF MOLECULAR SIGNALLING**

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.  
All symbols are of usual significance.*

1. Pick up the correct alternatives from the given multiple choices.(any **ten**) 1×10 = 10
- (a) Which one of the following signal molecule is not used for extracellular signaling?  
(i) Autocrine      (ii) Endocrine      (iii) Paracrine      (iv) Cyclic AMP
- (b) How many types of signaling are there?  
(i) Four      (ii) Five      (iii) Seven      (iv) Eight
- (c) P wave indicates  
(i) Depolarization of right ventricle      (ii) Depolarization of left ventricle  
(iii) Depolarization of both atria      (iv) Atria to ventricular conduction time
- (d) Ventricular muscle depolarization is indicated by  
(i) PR interval      (ii) P wave      (iii) U wave      (iv) The QRS complex
- (e) Which part of the neuron is sometimes myelinated?  
(i) Dendrite      (ii) Axon      (iii) Soma      (iv) Axon hillock
- (f) Rhodopsin is a combination of opsin and \_\_\_\_\_.  
(i) 11-cis- retinal      (ii) 10-cis- retinal  
(iii) 11-trans- retinal      (iv) 10-trans-retinal
- (g) Which vitamin is important for vision?  
(i) Vitamin A      (ii) Vitamin B      (iii) Vitamin C      (iv) Vitamin D
- (h) The inner most layer of human eye is  
(i) Cornea      (ii) Sclera      (iii) Retina      (iv) Choroid
- (i) Rod cells are sensitive to  
(i) Dim light      (ii) Light with high intensity  
(iii) Light with normal intensity      (iv) All of these
- (j) The following part of the inner ear is responsible for hearing is  
(i) Utricles      (ii) Cochlea  
(iii) Saccule      (iv) Semi circular canal
- (k) Which of the following part has no role in mechanism of hearing as such but is very important otherwise?  
(i) Ear ossicles      (ii) organ of corti  
(iii) Eustachian tube      (iv) vestibular apparatus

- (l) The middle ear is exposed to atmospheric pressure  
(i) Tympanic membrane (ii) Eustachian tube  
(iii) Pinna (iv) Auditory nerve
- (m) The human ear responses to vibration ranging from  
(i) 2Hz--2KHz (ii) 20KHz--20MHz  
(iii) 20KHz--20MHz (iv) 20Hz--20KHz
- (n) The image formed by human eye on retina is  
(i) Virtual and inverted (ii) Real and erect  
(iii) Real and inverted (iv) Virtual and erect
- (o) Astigmatism is corrected by  
(i) concave lens (ii) cylindrical lens  
(iii) convex lens (iv) bifocal lens

2. Answer any *ten* questions from the following: 2×10 = 20

- (a) What do you mean by colour blindness?  
(b) Elucidate the importance of ciliary muscles of human eye.  
(c) What do you mean by optical accommodation?  
(d) What are gap junctions?  
(e) What do you mean by Apoptosis?  
(f) Explain Gibbs-Donnan effect.  
(g) Briefly mention the optical elements of human eye.  
(h) Describe the structure of a neuron.  
(i) What is the intensity of sound corresponding to 65 dB?  
(j) What do you mean by Reduced Eye mode?  
(k) What do you mean by long-sightedness?  
(l) What do you mean by G<sub>0</sub> phase in cell cycle?  
(m) Mention the basic characteristics of signal molecules.  
(n) What are the different downstream effects of cell signalling pathways?  
(o) By what name the graphical representation of ECG is known as?

3. Answer any *two* questions from the following: 5×2 = 10

- (a) Define sound intensity. Discuss briefly on the mechanism of human hearing. 1+4  
(b) What do you mean by resting and action potential? What is the advantage of the myelinated axon in comparison with the non myelinated axon? 3+2  
(c) Distinguish between Rod and Cone cells. Explain the scotopic and photopic vision. 2+3  
(d) Distinguish between cAMP and AMP. How does cAMP activate protein kinase A? What is the role of adenylyl cyclase A? 2+1+2

**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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