Printed Page:- Subject Code:- ABT0305

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: III - THEORY EXAMINATION (2021 - 2022)

Subject: Biophysics

Time: 03:00 Hours Max. Marks: 100

General Instructions:

1. All questions are compulsory. It comprises of three Sections A, B and C.

- Section A - Question No- 1 is objective type question carrying 1 mark each & Question No- 2 is very short type questions carrying 2 marks each.
- Section B - Question No- 3 is Long answer type - I questions carrying 6 marks each.
- Section C - Question No- 4 to 8 are Long answer type - II questions carrying 10 marks each.
- No sheet should be left blank. Any written material after a Blank sheet will not be evaluated/checked.

SECTION A 20

1. Attempt all parts:-

1-a. Which of the following statement best characterizes glucose? (CO1) 1

1. It usually exists in the furanose form.
2. It is a ketose.
3. Carbon 2 is the anomeric carbon atom.
4. It forms part of the disaccharide sucrose.

1-b. Physical property of fatty acids depends on: (CO1) 1

1. Length of hydrocarbon chains
2. Degree of unsaturation
3. Branching
4. All of the above

1-c. The junction which is present between two neurons is called the_____ (CO2) 1

1. Synapse
2. neuromuscular
3. desmosome
4. gap junctions

1-d. Chemical transmission involves release of chemical messengers known as_____ (CO2) 1

1. neurotransmitters
2. calcium
3. sodium

4. potassium

1-e. Ions diffuse across membranes down their (CO3) 1

1. chemical gradients.
2. concentration gradients.
3. electrical gradients.
4. electrochemical gradients.

1-f. What are the membrane structures that function in active transport? (CO3) 1

1. peripheral proteins
2. carbohydrates
3. cholesterol
4. integral proteins

1-g. All amino acids are optically active except (CO4) 1

1. Glycine
2. Serine
3. Threonine
4. Tryptophan

1-h. Amino acids are covalently linked by_____bonds (CO4) 1

1. peptide
2. glycosidic
3. ionic
4. hydrogen

1-i. Actin filaments are involved in flagellar movement in bacteria. (CO5) 1

1. True
2. False

1-j. The role of calcium in muscle contraction is to spread the action potential. (CO5) 1

1. True
2. False

2. Attempt all parts:-

2-a. Give two real life examples of diffusion and osmosis? (CO1) 2

2-b. What is conduction blockage? (CO2) 2

2-c. Why do we need ion channels? (CO3) 2

2-d. What are chaperonins? (CO4) 2

2-e. Differentiate between actin and myosin? (CO5) 2

SECTION B 30

3. Answer any five of the following:-

3-a. Why do most substances have to be assisted through the plasma membrane? Contrast movement by facilitated transport with movement by active transport. (CO1) 6

3-b. Explain the process of micelle formation in detail? (CO1) 6

3-c.	Describe in brief the mechanism of synaptic transmission? (CO2)	6
3-d.	Name the different types of electrically excitable cells and explain their functions? (CO2)	6
3.e.	What type of cell transport uses carrier proteins. Discuss? (CO3)	6
3.f.	What are globular and fibrous proteins? Discuss it with the help of some examples? (CO4)	6
3.g.	With the help of labelled diagram describe the structure of microtubule? (CO5)	6

SECTION C

50

4. Answer any one of the following:-

4-a.	What happens to red blood cells when they are placed in pure water? Why do plant cells become flaccid in concentrated sugar solutions? (CO1)	10
4-b.	Are aquaporins passive or active transport. Explain? Can water enter cells without aquaporins? Do aquaporins require a living cell to function? (CO1)	10

5. Answer any one of the following:-

5-a.	Give a brief description about neuron? In a neuron cell how is an electrical impulse created and what is the role of synapse in this context ? (CO2)	10
5-b.	Enumerate the concept of action potential in signal transmission pathway? (CO2)	10

6. Answer any one of the following:-

6-a.	What are channel proteins? What are the different types of channel proteins? (CO3)	10
6-b.	Describe the structure of rhodopsin? Also state its importance and function? How does rhodopsin function as a light receptor? (CO3)	10

7. Answer any one of the following:-

7-a.	What are molecular chaperones? Discuss in detail about Hsp 70 and Hsp 60 family? (CO4)	10
7-b.	Write the difference between DNA and RNA? Describe the biophysics of RNA? (CO4)	10

8. Answer any one of the following:-

8-a.	What are the different classes of molecular motors? Discuss each of them? (CO5)	10
8-b.	Discuss in detail the structure and function of cilia and flagella? (CO5)	10