

PARUL UNIVERSITY
PARUL INSTITUTE OF APPLIED SCIENCES
MID SEMESTER INTERNAL EXAMINATION, MARCH 2020
M. Sc. Biochemistry Semester IV

Paper Name: Membrane Biology

Date: 06/03/2020

Paper Code: 11103251

Time: 1hr 30min

Max. Marks: 40

Instructions:

1. All questions are compulsory and options are given in first and second question only.
 2. Numbers to the right of question indicate the marks of respective question.
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Q. 1 Define **(08)**

1. Explain Singer Nicolson Model and recent modifications of Biological Membrane
2. Explain: Membrane Receptors, Ligand Gated Ion Channels and Ligand biased agonism

Q. 2 Attempt any three questions of the following. **(12)**

- (i) Short Note: Allosteric Proteins
- (ii) Short Note: Thermodynamic cycle and Principles of Detailed Balance
- (iii) Short Note: Membrane embedded estrogen receptor
- (iv) Short Note: Phospholipids
- (v) Short Note: Effect of botulinum toxin

Q. 3 Do as directed. Attempt all five questions. **(05)**

- (i) Define: Lipoproteins
- (ii) Define: Lipid Rafts and Caveolae
- (iii) Define: Flippases, floppases and scramblases
- (iv) Define: Positive Inside Rule
- (v) Define: Trafficking and Topogenesis

Q. 4 Write correct option in your answer sheet for following 15 multiple choice questions. **(15)**

MCQ 1 Conformational Change in protein is induced by
(A) Simple diffusion (B) Active Transport
(C) Facilitated diffusion (D) Ion driven active transport

MCQ 2 The distribution of intrinsic proteins in the cell membrane is
(A) Symmetrical (B) Asymmetrical
(C) Uniform (D) Randomly distributed

MCQ 3 In cell membrane, carbohydrates in glycoproteins or glycolipids are oriented
(A) Towards Inside (B) Towards outside
(C) Towards outside and inside (D) Randomly distributed

MCQ 4 Depolarization:
(A) is associated with increase in membrane permeability to Na+. (B) is terminated with closure of voltage activated K⁺ channels.
(C) is followed by muscle relaxation. (D) is caused by K⁺ efflux.

- MCQ 5 Action potential
 (A) is a graded potential. (B) is produced by sub threshold stimulus.
 (C) starts with repolarization caused by outward movement of Cl⁻. (D) is conducted slower in thin nerve fibers.
- MCQ 6 During depolarization:
 (A) voltage activated Na⁺ channels open. (B) the membrane becomes impermeable to Na⁺.
 (C) when membrane potential reaches -55 m.v Na⁺& K⁺ fluxes occur at the same time. (D) K⁺ ions diffuse outside.
- MCQ 7 The resting membrane potential is caused by:
 (A) Diffusion of K⁺ ions outside the nerve fibers. (B) Diffusion of Na⁺ ions inside the nerve fibers.
 (C) Opening of the chemically activated ion channels. (D) Opening of the voltage activated ion channels.
- MCQ 8 To measure resting membrane potential:
 (A) We use a special voltmeter or cathode ray oscilloscope (CRO). (B) We put the two electrodes outside the nerve fiber.
 (C) We stimulate the nerve by an effective stimulus (D) We put the two electrodes inside the nerve fiber.
- MCQ 9 Excitation contraction coupling involves all the following except:
 (A) Release of Ca⁺⁺ from troponin. (B) Formation of cross bridges between actin and myosin.
 (C) Spread of depolarization along the transverse tubules. (D) Hydrolysis of ATP to ADP.
- MCQ 10 In monophasic action potential:
 (A) One electrode is put inside and the other is put outside the same nerve fiber. (B) The spike is a large wave of short duration.
 (C) The spike is followed by positive after potential then negative after potential. (D) The ascending limb of the spike is due to K⁺ efflux.
- MCQ 11 The ingestion of liquid into a cell by the budding of small vesicles from the cell membrane is called
 (A) Pinocytosis (B) Endocytosis
 (C) Exocytosis (D) Voltage Channel mediated Transport
- MCQ 12which are a special type of lipid raft, are small (50–100 nanometer) invaginations of the plasma membrane in many vertebrate cell types, especially in endothelial cells, adipocytes and embryonic notochord cells.
 (A) Lipid rafts (B) Membrane Lipids
 (C) Phospholipids (D) Caveolae
- MCQ 13 The rule is an observation made by Gunnar von Heijne where he noticed that in membrane proteins, the collective charge of the intracellular residues tend to be more positive as compared to the extracellular Topogenic signals in integral membrane proteins
 (A) Negative Inside (B) Positive Outside
 (C) Positive Inside (D) None of the above
- MCQ 14 Biological Bilayer Membrane is
 (A) Hydrophilic (B) Hydrophobic
 (C) Both i and ii (D) None of the above

- MCQ 15 A process in which the plasma membrane invaginates or fold inward to form a vesicle that brings substances into the cell
- (A) Pinocytosis (B) Endocytosis
(C) Exocytosis (D) Voltage Channel mediated Transport

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