RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. SECOND SEMESTER EXAMINATION, AUGUST 2021

FIRST YEAR [BATCH 2020-23]

Date : 12/08/2021 **ZOOLOGY (HONOURS)**

Time : 11 am – 1 pm **Paper : IV [CC4]** Full Marks : 50

Answer all the questions:

Group A

1. a) Differentiate between channel protein and carrier protein.

   b) How does Ran-GDP/Ran-GTP cycle play a pivotal role in the nuclear transport?

   c) What is plasmalogen? [2+2+1]

2. a) After the formation of a lysosome, it fails to exert its natural functions although all the necessary enzymes were there. What is/are might the problem(s) according to you (establish with reason)?

   b) Briefly state the pathways of peroxisomal biogenesis.

   c) What do you mean by LHC (Light Harvesting Complex)? [2+2+1]

3. a) Differentiate between substrate level phosphorylation and oxidative phosphorylation.

   b) Muscle cells are having numerous SER while liver cells have both SER and RER. What might be the actuality for having this type of differentiation?

   c) Why ATP synthase is known as ‘molecular motor’? [2+2+1]

4. a) Briefly state the structural entities of NPC.

   b) Which among the two types of processes, endosymbiotic and *de novo*, you consider to be the most appropriate for the origin of mitochondria and why?

   c) Mention one advantage of Gram negative cell walled bacteria over Gram positive. [2+2+1]

Group B

5. State and explain mechanisms (at least three) by which the receptor and its functional modulation can impact the cell signaling and gene expression. [5]

6. ‘Apoptosis is an important cellular physiological mechanism.’—justify the statement mentioning the significance of apoptosis (and also the lack of it in transformed cells). [5]

7. a) How do the flow cytometry mechanisms help to analyse and study the different populations of cells?

   b) State the significance of cell cycle checkpoints (and the effect of it getting non-functional). [2.5+2.5]

Group C

8. a) Low speed cold centrifuge machine is used for what purpose? State one application of airfuge. Explain the terms RPM and RCF in relation to centrifugation. State their relationship.

   b) What is meant by the terms sedimentation coefficient (s) and Svedbergs (S). Mention their relationship, if any. [(½ + ½)+2(1+1)]

9. a) State the applications of bright-field microscopy and phase-contrast microscopy.

   b) "Fluorescence microscopy helps understand different biological processes including location and movement of macromolecules" – elaborate with examples.

   c) Name one application each of TEM and SEM. [1+3+1]

Group D

10. a) Illustrate the structure of microtubule.

    b) What are the significances of tight junction and gap junction? [3+2]

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