RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. SECOND SEMESTER EXAMINATION, JUNE 2022

FIRST YEAR [BATCH 2021-24]

Date : 22/06/2022

ZOOLOGY (HONOURS)

Time : 11 am – 1 pm

Paper : IV [CC4]

Full Marks : 50

Answer **any five** questions: [5×2]

1. a) What is Juxtacrine signalling?
   b) What are JAK and STAT?
   c) State the function of intermediate filament.
   d) What is an airfuge? Name a few applications.
   e) Define anterograde and retrograde cellular transports.
   f) Mention the function of aquaporin and OXA1 in mitochondrial membrane.
   g) What is CAD? Mention its significance.
   h) Differentiate between apoptosis and autophagy.

Answer **any four** questions**:** [4×10]

2. a) Demonstrate the structure of microtubule with a suitable diagram.
   b) Differentiate between collagen and elastin.
   c) What do you mean by treadmilling of microfilament? [(3+2)+3+2]

3. a) What is basement membrane?
   b) Write down its composition.
   c) Illustrate the structure and function of proteoglycan.
   d) Compare kinesin and dynein. [1+2+(3+2)+2]

4. a) Compare cytosolic receptor with nuclear receptor.
   b) Why GPCR is known as serpentine receptor?
   c) How does cAMP act as an secondary messenger? – explain with a suitable diagram. [3+1+(4+2)]

5. a) State the principle of dark field microscopy.
   b) Following microscopic techniques, how would you understand whether a cell is live or dead?
   c) Immunofluorescence is a powerful technique – state the principle and 1-2 applications.
   d) What are extrinsic and intrinsic fluores?
   e) State the applications of bright field and phase-contrast microscopy. [2+2+2+2+2]

6. a) Give two significant reasons for membrane fluidity.
   b) With a labelled diagram discuss the function of NPC in nuclear protein export.

c) Define zone of exclusion with its significance.

d) How does protein import occur in chloroplast with reference to TOC-TIC complex? [2+3+2+3]

7. a) Describe an experiment (with a schematic diagram) by which fluidic nature of plasma membrane could be proved.

b) What do you mean by CGN and TGN?

c) Discuss the successive steps of lysosome ontogeny.

d) Give two significant functions of SER. [3+2+3+2]

8. a) "p53 is regarded as the guardian of cell"—justify the statement.

b) Mention the function of 'WEE1' and 'CAK' in cell cycle checkpoint.

c) How does RB regulate the G1 checkpoint of cell cycle?

d) With a diagrammatic flowchart mention the steps involved in intrinsic path of apoptosis. [3+2+2+3]

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