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PG (NEW) CBCS
M.Sc. Semester-II Examination, 2019
ZOOLOGY
PAPER: ZOO-202
(BIOPHYSICS & BIOCHEMISTRY)

Full Marks: 40 **Time: 2 Hours**

Use separate Answer-scripts for Group-A & Group-B

GROUP-A
Biophysics
Marks-20

1. Answer any two questions of the following: **2×2=4**

a) How does change of pH affect base-pairing during DNA replication?

b) A solution contains 20 g of sucrose (MW = 342) per litre of water at 27°C. Calculate the osmotic pressure of this solution. 1+1

c) What is Tyndall effect? Why does it occur? 1+1

d) What, in your opinion, is the most important advantage of Osmium tetroxide in electron microscopic study of cells? What do you mean by an electron-dense part of a cell? 1+1

2. Answer any two questions of the following: **2×4=8**

a) Describe the structural design of an electron gun with illustration? How does it function? 3+1

b) What do you mean by the internal energy of a system? The latent heat of evaporation of water is 536 cal/g. Calculate ΔH and ΔE in converting 1 mole of water at 100°C into steam at the same temperature, assuming water to behave as an ideal gas. 1+3

c) Explain the process of electrodialysis with illustration. Comment on its practical application. 3+1

d) How does fluorescence microscopy help in the diagnosis of chronic myeloid leukemia? Give an example of metachromatic fluorescence. What do you mean by autofluorescence? 2+1+1

(Turn over)

3. Answer any one question of the following: 1×8=8

a) Distinguish between flip-flop movement and lateral diffusion of membrane lipids. Explain the significance of 'Fluorescence recovery after photobleaching' in the understanding of fluidity of a biomembrane. What do mean by homeoviscous adaptation of biomembrane? 2+4+2

b) What is Reynolds's number and what is its significance? Explain the role of hormones in regulation of blood volume. How do baroreceptors maintain homeostasis of blood pressure? 2+3+3

GROUP-B

Biochemistry

Marks-20

4. Answer any two questions of the following: 2×2=4

a. What is the role of disulphide bond in protein stability?

b. State the difference between coenzyme and cofactor.

c. What do you mean by transamination?

d. Why is TCA cycle considered to be a 'common metabolic pathway'?

5. Answer any two questions of the following: 2×4=8

a) Briefly describe the structure of silk protein. How does its conformation differ from that of hair protein? 2+2

b) What are catecholamines? Briefly describe their biosynthesis. 3+1

c) Explain the terms: ammonotelism, urcotelism and uricotelism, Define deamination. 3+1

d) Describe the pathway of gluconeogenesis from pyruvate. 4

6. Answer any one question of the following: **1×8=8**

a) i) What do you mean by B-oxidation of fatty acid?

ii) Briefly describe the process in case of palmitic acid.

iii) Explain the role of carmitive in B-oxidation.

iv) How many ATPs are produced from B oxidation of palmitic acid?

1+4+1+2= 8

b) i) What is Michaelis Menten equation?

ii) Prove km – [s] when enzymes activity reaches half of its minimum *velocity.*

iii) Write the difference between competitive and non-competitive inhibitors.

iv) What do you mean by the active site of an enzyme?

2+2+3+1=8

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