

QP Code: 22/PT/14/IIIA

POST-GRADUATE COURSE

Term End Examination — June, 2022/December, 2022

ZOOLOGY

Paper-3A : PHYSIOLOGY AND BIOCHEMISTRY

Time : 2 hours]

[Full Marks : 50

Weightage of Marks : 80%

Special credit will be given for precise and correct answer. Marks will be deducted for spelling mistakes, untidiness and illegible handwriting. The figures in the margin indicate full marks.

Use of scientific calculator is strictly prohibited.

1. Answer *two* questions : 9 × 2 = 18
 - a) What do you mean by Gibbs-Donnan membrane equilibrium ?
Describe the van't Hoff's laws of osmotic pressure. 5 + 4
 - b) What do you mean by diffusion coefficient ? Describe the Fick's
and Graham's laws of diffusion. 4 + 5
 - c) What is the difference between estivation and hibernation ?
Describe the physiological state of animal during hibernation. 4 + 5
 - d) Describe the HMP pathway. Write a note on the metabolic
significance of HMP shunt pathway. 5 + 4
2. Answer *three* questions : 6 × 3 = 18
 - a) What do you mean by echolocation ? Describe how high frequency
sound is used for echolocation. 2 + 4
 - b) What are pheromones ? Write a note on the different types of
pheromones. 2 + 4

- c) Why Kreb's cycle is also known as TCA cycle and Citric acid cycle ? How many molecules of NADPH_2 and FADH_2 are formed in Kreb's cycle ? Mention the site of occurrence of Kreb's cycle. 2 + 2 + 2
- d) What is the difference between redox potential and standard redox potential ? Mention the significance of redox potential in the electron flow between electron donor and electron acceptor. 2 + 4
- e) Describe how glutathione are synthesized within the cell. Mention the importance of glutathione. 5 + 1
- f) Write short notes on isozymes and ribozymes. 3 + 3
3. Answer *two* questions : 4 × 2 = 8
- a) Write notes on albinism and alkaptonuria. 2 + 2
- b) Describe the molecular mechanism of smooth muscle contraction in animals.
- c) What do you mean by bioluminescence ? Enumerate the biochemical reactions of bioluminescence occurring in the body of lampyrid beetle. 1 + 3
- d) What do you mean by regulon and operon ? Why lac operon is considered as inducible operon ? 2 + 2
4. Answer *two* questions : 3 × 2 = 6
- a) Write the cause and symptoms of type-I von Gierke's disease.
- b) Describe the important biological roles of plasma lipoprotein.
- c) Write a short note on the post-translational modification (PTM) of newly synthesized protein.
- d) Distinguish between acclimatization, acclimation and adaptation with example.