

U.G. 5th Semester Examination-2025

ZOOLOGY

[MAJOR-VI]

Course Code : ZOOL-M-T-501

(Animal Physiology)

[NEP-2020]

Full Marks : 40

Time : 2½ Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any five questions of the following:

2×5=10

- a) Define zymogen. Give one example.
- b) Distinguish between Bohr effect and Haldane effect.
- c) What are the functions of the Bundle of His and Purkinje fibres?
- d) What are crypts of Lieberkuhn? Mention their role of digestion.
- e) What are the structural and functional differences between salivary amylase and pancreatic amylase?
- f) What is juxta-glomerular apparatus? Mention its function.

- g) What is synaptic gutter? Mention its significance.
- h) What is the role of SNARE proteins in synaptic vesicle fusion?

2. Answer any two questions of the following:

5×2=10

- a) Explain carbon monoxide poisoning in terms of Hb affinity. What is the function of thrombin in the coagulation cascade? 3+2
- b) Explain saltatory conduction in nerve with diagram. What is the function of acetylcholinesterase in synaptic transmission? 3+2
- c) What are micelles? State their role in fat absorption. Explain the hormonal regulation of water balance involving ADH signalling pathways. 1+1+3
- d) What are the osmotic challenges faced by fresh water and marine fishes? Differentiate between isotonic and isometric muscle contractions.

3+2

3. Answer any two questions of the following:

10×2=20

- a) What are the advantages of counter current mechanism during urine formation? How kidney maintains the acid and base balance in our body fluids? What is vital capacity? Mention the role of haemoglobin as a buffer. 3+3+2+2

- b) Explain the molecular events of action-myosin cross-bridge cycling. Compare cholinergic and adrenergic synapses based on neurotransmitter, receptors, and signal termination. Discuss the role of inhibitory neurotransmitters in neuronal signalling. 3+4+3

- c) Explain the cardiac conduction system including the role of SA node as a pacemaker. Describe the structure and cooperative oxygen binding property of haemoglobin at the molecular level. What is the function of Dorsal Respiratory Group in medulla? What is anatomical dead space and how does it influence pulmonary ventilation efficiency? 3+3+2+2
- d) Describe the hypothalamic regulation of body temperature involving neural and hormonal pathways. What is countercurrent heat exchanger? Write a short note on counter-current multiplier system. Define mean arterial pressure (MAP). 3+2+3+2