

QP Code: 23/PT/14/VIIB

POST-GRADUATE COURSE

Term End Examination — June, 2023/December, 2023

ZOOLOGY

**Paper-7B : ENDOCRINOLOGY, CELL & TISSUE STRUCTURE
AND FUNCTION**

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.

1. Answer *two* questions : 9 × 2 = 18
 - a) Give an account of the structural differences of unstimulated and stimulated G proteins. How is the cyclic AMP produced in GPCR signalling ? State the significance of producing cyclic AMP. 3 + 3 + 3
 - b) Discuss the general mechanism of action of a steroid hormone. Differentiate between steroid and peptide hormones. 6 + 3
 - c) How can we identify cells that are undergoing apoptosis ? Explain the extrinsic apoptosis pathway. 3 + 6
 - d) Elaborate on the molecular events associated to the synthesis of testosterone hormone from pregnenolone. What are the sources of oestrogen and progesterone ? 6 + 3
2. Answer *three* questions : 6 × 3 = 18
 - a) Comment on the activities of the following hormones and major stimuli for their release from respective sources :
(i) Gastrin (ii) Cholecystokinin (iii) Secretin. 2 + 2 + 2
 - b) What is meant by 'flight-or-flight response' ? Explain the biosynthetic pathways of catecholamines. 2 + 4
 - c) Write a short note on membrane proteins, their movement mechanisms and lipid raft in the context of fluid mosaic model. 6

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[Turn over

- d) Which hormones are secreted from the adrenal cortex ? What is ACTH ? What are the physiological effects of hormones secreted from adrenal cortex ? 2 + 1 + 3
- e) Explain the biological actions of prolactin. Distinguish between lactotrophic and thyrotrophic cells. 4 + 2
- f) Briefly explain the RTK cell signalling pathway with an appropriate diagram. 6
3. Answer *two* questions : 4 × 2 = 8
- a) How does the hypothalamic-pituitary-leydig cell axis function ? 4
- b) What is the role of cytochrome C in apoptosis ? How are the Bcl2 family proteins associated to apoptosis ? 2 + 2
- c) Write notes on paracrine and autocrine signalling. 2 + 2
- d) State the activity of TPO and ThOX proteins required in thyroid hormone synthesis. 2 + 2
4. Answer *two* questions : 3 × 2 = 6
- a) Explain how the shape and amphipathic nature of the lipid molecules present in bio-membrane help to form lipid bilayers spontaneously.
- b) What are physiological effects of Ghrelin ?
- c) What is necrosis ?
- d) Write a short note on Graves' disease.
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