M.Sc. 4th Semester Examination, 2024

ZOOLOGY

PAPER—ZOO-402.1 & 402.2

Full Marks : 50

Time : 2 hours

Answer **all** questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

ZOO-402.1

(*Developmental Biology*)

1. Answer any *two* questions from the following : 2×2

(*a*) How does concentration of BMP differ in formation of different mesodermal component ?

(*b*) What are the signals produced by the organizing regions at the ends of the body in hydra ?

(*c*) What will be the fate of position of heart and gut if the expression of Xenopus nodal related 1 gene is permitted to occur on the right hand side of developing tadpole ?

(*d*) What will be the fate of Xenopus embryo if antisense morpholinos are used to eliminate BMP antagonists ?

2. Answer any *two* questions from the following : 4×2

(*a*) What will happen in the events of regeneration in Hydra when : $1 + 1 + 2$

(*i*) Hypostome tissue grafted into host trunk

(*ii*) Basal disc tissue grafted into host trunk

(*iii*) Both hypostome and basal disc tissues are transplanted together.

(*b*) In pattern formation of amphibian limb regeneration how the positional value is encoded molecularly ?

(*c*) Describe briefly the several adhesion systems that keep the mammalian sperm in its channel in zona pellucida.

(*d*) Explain the role of intercalation of positional values by growth in the regenerating cockroach leg by proper diagramme.

3. Answer any *one* question from the following : 8×1

(*a*) Which secondary messenger system play vital role in slow block of polyspermy in sea urchin ? State the mechanism with proper illustration.

(*b*) Describe briefly the process of vegetal induction of mesoderm in Xenopus oocyte with the help of a well accepted model.

ZOO-402.2

(*Neuroendocrinology*)

4. Answer any *two* questions from the following : 2×2

(*a*) State the modes of messenger secretion in vertebrate system.

(*b*) Mention the cell types present in the anterior pituitary gland of mammals.

(*c*) Why is Na+ ion channel impermeable to all other ions ?

(*d*) What do you mean by blood-brain barrier ?

5. Answer any *two* questions from the following : 4×2

(*a*) Distinguish between Electrical and Chemical synapse with an emphasis to Gap junctions.

(*b*) State the functional modality of Hypothalamic-pituitary-gonadal axis (HPG-axis) in vertebrate.

(*c*) Write a brief notes on PRL-secretion process.

(*d*) Give a comparative account of Neurotransmitter, Neuromodulator and Neurohormone.

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

(*a*) Explain the functioning of voltage gated *Na and* K-channels. $4 + 4$

(*b*) 'Alzheimer's disease is a genetically motivated pathogenecity– justify your answer with reasons. Write note on : Type-2 Diabetes. 6 + 2

[Internal Assessment — 10 Marks]
