



PG (CBCS)
M.Sc. Semester- IV Examination, 2023
ZOOLOGY
PAPER: ZOO 402
(DEVELOPMENTAL BIOLOGY AND NEUROENDOCRINOLOGY)

Full Marks: 40

Time: 2 Hours

Write the answer for each unit in separate sheet

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

ZOO 402.1

DEVELOPMENTAL BIOLOGY

F.M. - 20

GROUP-A

1. Answer any TWO of the following questions: 2×2=4
- Which signal is blocked to produce *Xenopus* head structure?
 - What is the function of sperm adhesion protein (SED1) in mammalian fertilization?
 - Why premetamorphic mesenchyme is able to regenerate newt forelimb?
 - In which area noggin and chordin mRNA is expressed?

GROUP-B

2. Answer any TWO from the following questions: 2×4=8
- Give signalling mechanism in specification of mesoderm in *Xenopus*.
 - Enumerate the function of Resact as sperm activating peptide in Sea Urchin.
 - How bone morphogenesis protein (BMPS) are inhibited in notochordal mesoderm are in *Xenopus* embryo?
 - How does muscle cell re-enter the cell cycle in newt limb regeneration and why it is needed?

GROUP-C

3. Answer any ONE of the following questions: 1×8=8
- What is grey crescent area?
 - How maximum goosecoiled expression is activated in *Xenopus* organiser?
 - How organiser is formed by the interaction of *Xenopus* nodal related protein (Xnr) and TGF β factor?
 - State briefly the early response of sea urchin egg after sperm binding.

(P.T.O)

ZOO 402.2
NEUROENDOCRINOLOGY

F.M. - 20

GROUP-A

4. Answer any TWO from the following questions: 2×2=4
- a) Name the cells that produce the myelin sheath around the neuronal axons in the CNS and the PNS, respectively.
 - b) What are neural circuits?
 - c) What is the basic difference between type 1 and type 2 diabetes mellitus?
 - d) What are LATS antibodies?

GROUP-B

5. Answer any TWO from the following questions: 2×4=8
- a) Tabulate the differences between fine structure, secretory activity and physiological function of ordinary neurons and neurosecretory cells.
 - b) Classify neurotransmitter depending upon chemical nature as well as upon their mood of action. What is holocrine communication? 3+1
 - c) What do you mean by neuroendocrine integration? Explain third-order neuroendocrine integration with the help of a sketch diagram 1+3
 - d) What are synapses? Differentiate chemical synapse from electrical synapse?

GROUP-C

6. Answer any ONE from the following questions: 1×8=8
- a) Draw a labelled diagram of neurosecretory structures in insects. Name the neurohormones and state their functions in insect metamorphosis? 2+6
 - b) Describe the molecular basis of amyloid plaque formation in brain in Alzheimer's disease with illustration. Briefly describe the symptoms, cause, diagnosis and control of exophthalmic goiter. 4+4
