

**M.Sc. 4th Semester Examination, 2025**

**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)*

**GROUP — A**

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

(a) What happens to newt embryo if they are made to synthesize excess frisbee (Frzb) ?

( Turn Over )

(b) If antisense morpholino are used to eliminate Noggin, Chordin and Follistatin, what will be the fate of resulting amphibian embryo ?

(c) What happens if pit-2 protein is injected into right side of the *Xenopus* embryo ?

(d) Mention the two regulators/factors for acrosome reaction and cortical granula reaction.

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

(a) State the antagonistic relationship between BMPs (Bone Morphogenetic Protein) and the organizer with a suitable model studied by you.

(b) How the acrosome reaction is initiated in sea urchin *strongylocentrotus purpuratus* ?

(c) Explain the role of prod 1 gene expression in amphibian blastema.

(d) Briefly describe the role of a pair of signal gradients produced by Hydra head organizer with a model studied by you.

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

(a) State the roles of different molecules secreted from pharyngeal endoderm and head-mesoderm to produce most anterior regions of head and brain in amphibia.

(b) Describe the events of mammalian sperm capacitation with a hypothetical model studied by you. (Provide suitable diagram)

**ZOO-402.2**

*(Neuroendocrinology)*

**GROUP – A**

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

(a) Why crypt neurons are important in fish ?

(b) All neurons are NSC but all NSCs are not neurons— Justify.

(c) What is adrenal crisis ?

(d) Why does action potential move unidirectionally ?

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

(a) 'Neuron is an excitable tissue'— Explain with relevant diagram(s).

(b) Write notes on :

(i) Chemical synapse

(ii)  $\beta$ -Amyloid protein.

(c) How you establish the interrelationships between immunotransmitters and neuro-endocrine circuits ?

(d) Discuss about the hormonal regulation involved in molting process of insects with suitable diagram.

6. Answer any *one* question of the following :

(a) (i) Elucidate the role of calcium in synaptic transmission.  $8 \times 1$

(ii) State the difference between voltage gated and ligand gated ion channels. Draw the typical structure of a  $Ca^{2+}$ -channel.  $4 + 2 + 2$

( 6 )

- (b) Why Parkinson's disease described as the shaking Palsy's and state its Aetiology? Briefly describe the recommended assessment of the patient with Parkinson's disease. What tests can help diagnose conditions affecting the substantia nigra? 4+2+2

[ Internal Assessment — 10 Marks ]

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