

2022

M.Sc.

4th Semester Examination

ZOOLOGY

PAPER—ZOO-402

Full Marks : 40

Time : 2 Hours

The figures in the margin indicate full marks.

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

Illustrate the answers wherever necessary.

ZOO-402.1 DEVELOPMENTAL BIOLOGY

1. Answer any two questions : 2×2

- (a) What happens if treatment of regenerating tails with retinoic acid occurs at the same time when hindlimbs are developing?
- (b) Mention the axis specified by BMP gradient and wnt gradient.

(Turn Over)

- (c) Name the gradients involved in head regeneration in Hydra.
- (d) What is the function of sperm adhesion proteins (SED 1) in mammalian fertilization ?

2. Answer any *two* questions : 2×4

- (a) Explain the roles of Prod 1 gene expression in amphibian blastema.
- (b) Give signalling mechanism in specification of mesoderm in *Xenopus*.
- (c) State the roles of calcium ion as the initiator of the cortical granule reaction.
- (d) Explain the phenomenon of proximo-distal intercalation in amphibian limb generation.

3. Answer any *one* question : 1×8

- (a) State briefly the possible mechanism stating the role of gamma-class of phospholipase C and Src family of protein kinase in sea-urchin egg activation.
- (b) Discuss several steps in the binding of a hyperactivated, wiggling mouse sperm to the Zona pellucida with possible model.

ZOO-402.2 NEUROENDOCRINOLOGY

4. Answer any *two* questions : 2×2
- (a) Does Action potential have the capacity to propagate in both directions along a conducting fibre ?
 - (b) Give two examples each of excitatory and inhibitory neurotransmitters.
 - (c) Mention role of Na-K ATPase pump.
 - (d) What are the diagnostic symptoms of Parkinson's disease ?
5. Answer any *two* questions : 2×4
- (a) Elaborate the calcium hypothesis for chemical synaptic transmission.
 - (b) Schematically classify the Nervous System mentioning functions of different sub-categories.
 - (c) Exemplify third-order neuroendocrine integration with reference to mammals.
 - (d) Give an account of amyloid plaque formation in Alzheimer's disease.

6. Answer any *one* question : 1×8
- (a) Write short notes on any *two* : 4×2
- (i) Refractory period ;
 - (ii) Ultra-structure of synaptic junction ;
 - (iii) Parts of Diencephalon ;
 - (iv) Cause of exophthalmic goiter.
- (b) Elaborate the roles of neurohormone in neuroimmune integration in mammals including humans. Explain structure of voltage-gated Na-channel. 4+4
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