2022

M.Sc.

4th Semester Examination (CCAE)

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) In which area noggin and chordin mRNA are expressed ?

(b) Name two diffusible proteins blocking wnt pathway.

(c) What happens if regenerating tail of a tadpole is treated with retinoic acid at the same time as hindlimbs are developing ?

(d) Name the peptide which has sperm-attracting and sperm activating properties in sea-urchin.

2. Answer any *two* questions : 2×4

(a) How does bone morphogenesis protein (BMP4) expression regulated during emphibian gastrulation ?

(b) How does WNT proteins act as a major head inducer of hydra hypostome organizer ?

(c) How does mechanism of capacitation in mammal enable sperm to become hyperactive ?

(d) How newt cells recognize a discontinuity in positional value by grafting a distal blastema to a proximal stump in amphibia.

3. Answer any *one* question : 1×8

(a) Describe the pathway of sea-urchin egg activation.

(b) Describe the model of the mechanism by which the dishevled protein (Dsh) stabilizes β-catenin in the dorsal portion of the amphibian embryo.

ZOO-401.2 NEUROENDOCRINOLOGY

4. Answer any *two* questions : 2×2

(a) What are pseudo-unipolar neurons and where are they found ?

(b) Name a substance that can act as both an excitatory and an inhibitory neurotransmitter. How can it do so ?

(c) Name the cells that produce the myelin sheath around the neuronal axons in the CNS and the PNS, respectively.

(d) What is the cytological marker of Parkinson's disease and what is made up of ?

5. Answer any *two* questions : 2×4

(a) Tabulate the differences between the structure and function of ordinary neurons and neurosecretory cells.

(b) Name a neuromodulator and mention its source. How do the neuromodulator differ from the neurotransmitters ? 1+3

(c) Name four brain neurohomones of insects and mention the major function of each of those neurohormones.

(d) What do you mean by neuroendocrine integration ? Explain first-order neuroendocrine integration with the help of a schematic model. 1+3

3. Answer any *one* question : 1×8

(a) Enumerate the role of endorphins and enkephalins in neuroimmune integration. Explain the neuroendocrine basis of eyestalk ablation in prawn culture. 5+3

(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 goitre. 4+4

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