

**2023**

**M.Sc.**

**4th Semester Examination (CCAЕ)**

**ZOOLOGY**

**PAPER : ZOO-402.1 & 402.2**

*Full Marks : 40*

*Time : 2 hours*

*The figures in the right hand margin indicate marks.*

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

*Illustrate the answers wherever necessary.*

**SECTION—I**

**( ZOO-402.1 )**

**( DEVELOPMENTAL BIOLOGY )**

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

(a) Name two epidermal inducer proteins.

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- (b) What is the role of newt anterior gradient protein?
- (c) Write the role of CD9 in IZUMO protein mediated fertilization.
- (d) How does vitelline envelope become hardened?

2. Answer *any two* questions from the following :  
4×2=8

- (a) Discuss the process of vegetal pole induction of mesoderm in *Xenopus*.
- (b) How sequential physiological changes in sperm help to successful fertilization?
- (c) Describe the WNT/beta catenin signalling during budding in hydra.
- (d) How sperm activating peptides help to migrate towards egg? Elaborate with suitable example.

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

- (a) Describe the mechanism by which beta catenin become stabilized in the dorsal area of the amphibian egg. 8
- (b) How does intracellular pH increase stimulate the DNA synthesis. What is the role of calcium ion in sea urchin egg activation pathway?  
3+5=8

( 3 )

SECTION—II

( ZOO-402.2 )

( NEUROENDOCRINOLOGY )

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

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

(b) Name a substance that can act as both an excitatory and an inhibitory neurotransmitter. How does 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 basic difference between type 1 and type 2 diabetes mellitus?

5. Answer *any two* questions from the following :  
4×2=8

(a) Tabulate the differences between the structure, secretory activity and function of ordinary neurons and neurosecretory cells.  
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(b) How do the neuromodulators differ from the neurotransmitters? Give an example of neuromodulator.  
3+1=4

( 4 )

(c) What do you mean by third-order neuroendocrine integration? Explain the phenomenon with reference to the mammals.

1+3=4

(d) Name four brain neurohormones of insects and mention the major function of each of them.

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

8×1=8

(a) Name the releasing and inhibiting hormones secreted by the hypothalamus. Mention the nuclei from which these are secreted and also mention their respective functions. Elaborate the neuroendocrine basis of eyestalk ablation in prawn culture.

4+4=8

(b) Discuss the molecular aspect of pathogenesis of Alzheimer's disease with illustration. Briefly describe the symptoms, cause and control of Parkinson's disease.

4+4=8

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