

2022

## ZOOLOGY — HONOURS

Paper : CC-3

(Non-Chordates - II)

Full Marks : 50

*The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**Question no. 1 is compulsory and answer any four questions from the rest.*1. Answer *any five* questions :

2×5

- (a) Distinguish between schizocoelomates and enterocoelomates.
- (b) Distinguish between trachea and tracheoles.
- (c) What is resilin?
- (d) Comment on functional significance of tracheal tenidium.
- (e) Give the scientific name of silver fish and cuttle fish.
- (f) What is stomochord?
- (g) Differentiate between malpighian tubules and malpighian corpuscles.
- (h) Write the characteristics of eusocial insects.
- (i) What role do the corpora cardiaca play in insect metamorphosis?

2. (a) Mention typical features of the Phylum Onychophora.

(b) Why are onychophorans considered as a connecting link between annelids and arthropods?

(c) What is strobilisation?

4+4+2

3. (a) Which arthropods possess only simple and only compound eyes? Mention their respective classes.

(b) Describe the structure of gill in prawn with labelled diagram. Briefly describe the process of respiration in prawn.

(2+2)+(4+2)

4. Justify the statements with proper reasons :

2×5

- (a) Spider belongs to class Arachnida.
- (b) *Pila* sp. is a gastropod.
- (c) Pseudocoelom is not a coelom.
- (d) Termite is a social insect.
- (e) Radula in mollusc.

Please Turn Over

5. (a) Comment on the functions of tube feet and madreporite.  
(b) Describe the structure of septal nephridia with suitable diagram.  
(c) Mention the systematic position of *Limulus* sp., *Aphrodite* sp. and *Sepia* sp.  $(1\frac{1}{2}+1\frac{1}{2})+4+3$
6. (a) Comment on different types of torsion exhibited by molluscs.  
(b) 'Tornaria larva exhibits clandestine evolution.' — Justify it.  $6+4$
7. (a) State the significance of Echinoderm larva.  
(b) Differentiate between radial canal and ring canal.  
(c) What is polian vesicle? Mention its function.  $4+2+(2+2)$
8. (a) Describe the feeding mechanism in *Pila* sp.  
(b) Discuss briefly the mosaic image formation in cockroach eye.  
(c) What role does juvenile hormone play in insect metamorphosis?  $4+4+2$



2022

## ZOOLOGY — HONOURS

Paper : CC-4

(Cell Biology)

Full Marks : 50

*The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.*1. Answer **any five** questions :

2×5

- ☒ (a) Distinguish between v-one and c-one.
- (b) Define cis-trans polarity of Golgi.
- (c) Name two kinetochore associated protein.
- ☒ (d) Distinguish active transport and facilitated diffusion.
- ☒ (e) Name two enzymes of inner mitochondrial membrane.
- ☒ (f) Distinguish between N-linked and O-linked glycosylation.
- (g) Why RTKs are so called?
- ☒ (h) Which organelle is known as 'traffic police' and why?

Answer **any four** from the following.

- ☒ 2. (a) With suitable diagrammatic illustration explain signal transduction through RTK pathway.  
(b) Define and explain membrane asymmetry.  
(c) What is RBC ghost? (2+3)+(1+3)+1
- 3. (a) Describe the modification of secretory protein in Golgi.  
(b) Mention the function of KDEL.  
(c) Explain the endosymbiotic hypothesis of mitochondrial origin. 5+2+3
- ☒ 4. (a) Explain the role of P<sub>53</sub> in DNA damage checkpoint.  
(b) Briefly mention the process of G2-M transition of cell cycle in yeast.  
(c) Define APC/C. 4+4+2

Please Turn Over

5. (a) What is haplo-insufficiency?  
(b) Distinguish between hereditary and sporadic Ratinoblastoma preferably with flow diagram.  
(c) With suitable illustration explain the intrinsic pathway of apoptosis. 2+4+4
6. Both histones and non-histones proteins are essential for DNA packaging in eukaryotic cells. However, these classes of proteins are fundamentally dissimilar in a number of ways. Describe how they differ in terms of—  
(a) their protein characteristics  
(b) their interaction with DNA  
(c) their role in DNA packaging. 3+3+4
7. Write short notes on (*any two*) : 5×2  
(a) V Snare and 'T' Snare  
(b) Desmosomes  
(c) Intermediate filament  
(d) Clathrin coated vesicle.
8. (a) Distinguish between proto-oncogene and tumour suppressor gene.  
(b) Define burkitt's lymphoma, glycocalyx, transducer.  
(c) What are MPFs? 2+(2+2+2)+2
-