

2026

Zoology (Core)

Paper Code : ZL-CE-6334

Paper Name : Developmental Biology

Time : 2 hours

Full Marks : 50

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer : 1×4=4
- a) Cytoplasmic determinants are :
- i) Nuclear proteins
 - ii) RNA/proteins present in cytoplasm
 - iii) Hormones
 - iv) Enzymes only
- b) Holoblastic cleavage occur in :
- i) Yolk-rich eggs
 - ii) Isolecithal eggs
 - iii) Telolecithal eggs
 - iv) Centrolecithal eggs
- c) Hydra shows :
- i) Epimorphosis
 - ii) Morphallaxis
 - iii) No regeneration
 - iv) Budding only
- d) ESCs are derived from :
- i) Adult tissues
 - ii) Blastocyst stage embryo
 - iii) Blood

Contd.

iv) Bone

2. Answer the following questions : $2 \times 3 = 6$

- a) What is Polyspermic fertilization ?
- b) Explain the role of organizer in development.
- c) Draw a neat and labelled diagram of mammalian spermatozoon.

3. Answer the following questions (*any two*) : $5 \times 2 = 10$

- a) Write about the types of extraembryonic membranes in chick.
- b) Give a short note on epiboly.
- c) Write a note on the concept of fertilization in ancient Indian literature.
- d) What are the medical applications of developmental biology.

4. Answer the following questions (*any three*) : $10 \times 3 = 30$

- a) Describe the role of cytoplasmic determinants and asymmetric cell division in early embryogenesis. 10
- b) Describe the fate map of the chick embryo indicating the presumptive regions of the blastoderm. Briefly explain the major fate-mapping techniques and highlight their significance in studying embryonic development. $5 + 5 = 10$
- c) Describe the mechanism of regeneration and blastema formation. 10
- d) Discuss endocrine regulation of metamorphosis in amphibians and insects. 10
- e) Describe embryonic stem cell, their characteristics and therapeutic potential. 10
- f) Discuss amniocentesis, its procedure, advantages, limitations and ethical concerns. 10

