2025

(NEP—2020)

(5th Semester)

ZOOLOGY (MAJOR2)

(Embryology)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick (✓) the correct answer in the brackets provided : 1×10=10

1. The acrosome of sperm is derived from

(a) nucleus ( ) *(b)* Golgi apparatus ( )

(c) mitochondria ( ) *(d)* endoplasmic reticulum ( )

2. Holoblastic cleavage occurs in

(a) birds ( ) *(b)* reptiles ( )

(c) insects ( ) *(d)* amphibians ( )

3. The zona pellucida is a glycoprotein layer found in

(a) ovum ( ) *(b)* sperm head ( )

(c) follicle cells ( ) *(d)* uterus ( )

4. Which of the following prevents polyspermy immediately after fertilization?

(a) Cortical reaction ( )

(b) Fast block (change in membrane potential) ( )

(c) Zona reaction ( )

(d) Formation of pronuclei ( )

5. Blastula of frog is characterized by

(a) solid ball of cells ( ) *(b)* formation of notochord ( )

(c) hollow ball with blastocoel ( ) *(d)* neural folds ( )

6. The mammalian placenta is formed from

(a) yolk sac and amnion ( ) *(b)* chorion and allantois ( )

(c) amnion and chorion ( ) *(d)* chorion and yolk sac ( )

7. In *Hydra*, regeneration occurs by

(a) morphallaxis ( ) *(b)* epimorphosis ( )

(c) budding ( ) *(d)* fragmentation ( )

8. The function of allantois in chick is

(a) excretion and respiration ( ) *(b)* mechanical protection ( )

(c) nutrition only ( ) *(d)* yolk absorption ( )

9. The hormone primarily responsible for amphibian metamorphosis is

(a) estrogen ( ) *(b)* insulin ( )

(c) triiodothyronine (T_3) ( ) *(d)* adrenaline ( )

10. *Hox* genes encode

(a) enzymes ( ) *(b)* transcription factors ( )

(c) structural proteins ( ) *(d)* *cytoskeletal proteins* ( )

(SECTION : B—SHORT ANSWERS)

(*Marks* : 25)

Write short notes on *five* of the following, taking at least *one* from each Unit : 5×5=25

UNIT—I

1. Types of egg

2. Spermatogenesis

UNIT—II

3. Fate maps

4. Artificial parthenogenesis

UNIT—III

5. Functions of mammalian placenta

6. Morphallaxis

UNIT—IV

7. Free radical theory of ageing

8. Homeotic genes

(SECTION : C—DESCRIPTIVE)

(*Marks* : 40)

Answer *four* questions, taking *one* from each Unit : 10×4=40

UNIT—I

1. Write an essay on the hormonal regulation of gametogenesis in males and females.

2. Describe the types and patterns of cleavage in animals. Explain with diagrams.

UNIT—II

3. Explain the process of gastrulation in frog. Discuss the role of involution, epiboly and invagination.

4. Describe the process of fertilization in animals. Distinguish between external and internal fertilization with examples.

UNIT—III

5. Explain the extraembryonic membranes in chick embryo and their respective functions.

6. What is regeneration? Describe the regeneration in invertebrates with suitable examples.

UNIT—IV

7. Discuss the organization and role of *Hox* genes in *Drosophila* development.

8. Describe the process of amphibian metamorphosis. How is it regulated by hormones?

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