

QP Code: 23/PT/14/VIIA

**POST-GRADUATE COURSE**

**Term End Examination — June, 2023/December, 2023**

**ZOOLOGY**

**Paper-7A : DEVELOPMENTAL BIOLOGY**

Time : 2 hours ]

[ Full Marks : 50

Weightage of Marks : 80%

**Special credit will be given for precise and correct answer. Marks will be deducted for spelling mistakes, untidiness and illegible handwriting. The figures in the margin indicate full marks.**

1. Answer *two* questions : 9 × 2 = 18
  - a) What is stem cell ? Briefly discuss the different types of stem cells on the basis of their potency. What is cell lineage ? 2 + 5 + 2
  - b) Explain the two sets of mechanisms found in sea urchin eggs to prevent polyspermy. What is meant by capacitation of sperm in mammals ? 6 + 3
  - c) Discuss the role of poleplasm in brief in the development of *Drosophila melanogaster*. What is the significance of Oskar gene in the development of the anterior-posterior axis of a larval fly ? 6 + 3
  - d) Differentiate between hemimetabolus and holometabolus development. Elaborate the role of PTH and ecdysone in insect metamorphosis. What is 'stadium' ? 2 + 6 + 1
2. Answer *three* questions : 6 × 3 = 18
  - a) Define teratogenic drugs with examples. What are the teratogenic effects of thalidomide ? 3 + 3
  - b) How do the adult stem cells differ from the embryonic stem cells ? What are the uses of stem cell therapy ? 3 + 3
  - c) Explain the role of Bicoid and Nanos proteins in the development of fruit fly. 6
  - d) Discuss about the regulation of molecular events by thyroid hormones in metamorphosis of amphibians. 6
  - e) Write down the basic steps of *in vitro* fertilization. 6

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- f) What is immunocontraception ? Write the differences between contraception and immunocontraception. 2 + 4
3. Answer *two* questions : 4 × 2 = 8
- a) Name the active genes involved in the male germ line of *Drosophila*.  
What is 'Nebenkern' ? 2 + 2
- b) What is the importance of moulting in insect metamorphosis ? What will happen if corpora allata is removed from a third instar larva ? 2 + 2
- c) Write a short note on 'Stem cell niche'. 4
- d) What are the roles of Semenogelin (Sg) and Prostate Specific Antigen (PSA) ? 2 + 2
4. Answer *two* questions : 3 × 2 = 6
- a) What are the limitations of IVF procedure ? 3
- b) What is teratogenesis ? Give example. 2 + 1
- c) Briefly mention the steps of the acrosome reaction. 3
- d) What are vasa efferentia, vas deferens and epididymis ? 3
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