24.1.25

M.Sc. Examination, 2024
Semester-III
Zoology
Paper: MZCT-303
(Comparative Endocrinology)

Time: Three Hours **Full Marks: 40**

Questions are valued as indicated in the margin.

*Answer **any four** questions.*

1. Describe with a suitable diagram the interaction between GHRH, IGF-1, SST and ghrelin on the somatotrope to release growth hormone from the anterior pituitary. Differentiate between pituitary dwarfism and hypothyroid dwarfism. Briefly describe the role of ACTH in the stimulation of steroidogenesis. 5+2+3=10

2. How does an *in situ* hybridization study help in the localization of neurohormones? How does propylthiouracil (PTU) act as a thyroid inhibitor? With a suitable diagram, briefly describe the biosynthesis of medullary catecholamines. 3+3+4=10

3. Describe the ultrastructural features of pinealocytes under electron microscopy. What is the effect of melatonin on photoperiodism in seasonal breeding among animals? 5+5=10

4. Define the first and second messenger with suitable examples for hormone action. Describe briefly, with an appropriate diagram, the mechanism of steroid action through nuclear receptors. Add short notes on the importance of chaperone proteins, hormone response elements (HREs), ligand-activated transcription factors, and nuclear adaptor proteins for steroid hormone action. 2+4+(1+1+1+1) =10

5. Describe the cephalic neuroendocrine system of insects with a suitable diagram and cite their role in insect development. Write the biosynthetic pathway of insect juvenile hormones of 'Mevalonate pathway'. 4+4+2=10

6. Write short notes on ***any two*** of the following: 5x2=10

   a. Regulatory mechanisms of vitellogenesis in Insects
   b. Congenital adrenal hyperplasia (CAH)
   c. Environmental thyroid-disrupting contaminants
   d. Sertoli-Cell-Only syndrome

DC 20/1/25

M. Sc. Examination, 2024
Semester- III
Zoology
Course: MZCT-302
(Biology of Infectious Diseases)

Time: 3hours **Full Marks:40**

Questions are of value as indicated in the margin
*Answer **any four** questions*

1. Define amebiasis. Explain the escape mechanism of *Entamoeba histolytica* from host immune response 2+8=10

2. What are different symptoms of dengue fever? Explain briefly the functions of Dengue-virus non-structural proteins. How Tourniquet test help to detect dengue 2+6+2=10

3. Elucidate briefly the process of granuloma formation in *Mycobacteria tuberculosis* infection. How do the bacilli escape from this granuloma in later phase of infection? Discuss the diagnostic methods for detecting this bacterium. 4+2+4=10

4. Give a brief account on the life cycle of Influenza A virus. Explain antigenic shift and antigenic drift with reference to this virus. Add a brief note on the different pandemics occurred related to this virus. 6+2+2=10

5. How do you differentiate between soft ticks and hard ticks? Describe the SAT candidates during tick -host-pathogen interaction that prevent platelet aggregation and inhibit complement activation 2+8=10

6. Write notes on *any **two*** of the following: 5x2=10

   a. Action of cholera toxin
   b. Functional properties of Polio virus proteins
   c. One-host tick life cycle
   d. Salk and Sabin vaccine

15/01/2025

M.Sc. Examination 2024

Semester- III

Zoology

Course: MZCT- 301

(Developmental Biology)

Time: Three hours

Full marks: 40

Questions are of value as indicated in the margin

Answer any ***four*** questions

1. Give a schematic representation of the hierarchy of gene functions of body patterning in *Drosophila*. How are the *bicoid* messages localised within oocyte and nanos gradient is established in the embryo of *Drosophila*? Delineate the molecular mechanism for patterning of the terminae of this fly. 2+ 5 + 3 = 10

2. Provide evidence that planarian regeneration is stem cell mediated. State the role of cNeoblast in regeneration of *Planaria* sp. Explain positional identities of cells of an amphibian regenerate with the help of the polar coordinate model. 2+3 + 5 =10

3. Explain the 'Anti angiogenic hypothesis' for thalidomide induced developmental defects. Mention the role of cereblon (CRBN) in linking thalidomide with teratogeny. Distinguish between mosaic pleiotropy and relational pleiotropy citing one example from each. 3 +2 + 5 =10

4. What is grey crescent? Elaborate events of its formation? How does the organizer form in an amphibian embryo? State the role of the organizer in development. 1+ 3+ 3+ 3 = 10

5. What is regenerative medicine? State the therapeutic potentials of ESCs and iPSCs. Add a note on regulatory mechanism operating in haematopoietic stem cell niche. 2+5+3 =10

6. Write notes on **any two** of the following: 5 x 2 = 10

   (a) Assisted reproductive technologies (ART)
   (b) Role of 'dorsal' in axis specification of *Drosophila*
   (c) Germplasm and germ line specification
   (d) Epithelial mesenchymal transition (EMT).