

**Post Graduate Teaching Department of Zoology**  
**An Autonomous Department of**  
**Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur**  
**M. Sc. Zoology Semester -IV (CBCS)**  
**Special Group: Mammalian Reproductive Physiology -I**  
**Theory Examination Summer-2023**  
**Name of the Paper: Paper 4T2: Reproductive Endocrinology**

**Time: 3hrs**

**Maximum Marks: 60**

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**Note**

- 1. All the questions are compulsory.**
- 2. All questions carry equal marks.**
- 3. Draw well labelled diagrams and charts wherever necessary.**

**Q.1** Describe the anatomy, cytoarchitecture and function of hypothalamus. **12**  
**OR**

**Write notes on: -**

- (a) Types of neuron and classification of neurotransmitter.
- (b) Feedback regulatory mechanism of ACTH and TSH.

**Q.2** Give an account on structure and regulation of Oxytocin and add a note on its role in reproduction. **12**  
**OR**

**Write notes on: -**

- (a) Structure of pituitary gland and mention the functions of hormones secreted by it.
- (b) Structure, secretion and functions of gonadotropin hormones.

**Q.3** Give an account on histology of ovary and biosynthesis of estrogen. Add a note on two cell two gonadotropin theory. **12**  
**OR**

**Write notes on: -**

- (a) Histology of adrenal gland and mention its connections with gonads.
- (b) Hypothalamo-hypophyseal-testis axis.

**Q.4** Describe the Androgen in detail, including its biosynthesis, mode of action, mode of transport, and functions. **12**  
**OR**

**Write notes on: -**

- (a) Mechanism of transport of oestrogen and its functions.
- (b) Progesterone biosynthesis and its mode of action.

**Q. 5 Write in brief on the followings: -** **12**

- (a) Releasing and inhibiting hormones.
- (b) Vasopressin.
- (c) Hyperaldosteronism.
- (d) Inhibin.

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**Special Group: Animal Physiology-I**  
**Theory Examination Summer-2023**  
**Name of the Paper: Paper 4T2: Physiology of Brain, Nerve and Muscle**

**Time: 3hrs**

**Maximum Marks: 60**

**Note**

- 1. All the questions are compulsory.**
- 2. All questions carry equal marks.**
- 3. Draw well labelled diagrams and charts wherever necessary.**

**Q.1** Describe the structure and functions of cerebellum. **12**

OR

**Write notes on: -**

- (a) Forebrain.
- (b) Brain Stem.

**Q.2** What is synapse? Describe in detail molecular mechanism of synaptic transmission in cholinergic nerve endings. **12**

OR

**Write notes on: -**

- (a) Types and ultrastructure of neuron.
- (b) Nernst equation.

**Q.3** Give a detail account on the biosynthesis, storage and release of Epinephrine and GABA. **12**

OR

**Write notes on: -**

- (a) Oxytocin and Vasopressin.
- (b) Photoreceptors.

**Q.4** Give a detail account on the molecular mechanism of muscle contraction. **12**

OR

**Write notes on: -**

- (a) Neuromuscular Junction.
- (b) Neuromuscular Disorders.

**Q. 5 Write in brief on the followings: -** **12**

- (a) Operant conditioning.
- (b) BDNF.
- (c) Alzheimer's disease.
- (d) Troponin.

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**M. Sc. Zoology Semester -IV (CBCS)**  
**Special Group: Entomology-I**  
**Theory Examination Summer-2023**  
**Name of the Paper: Paper 4T2: Sense Organs, Social Life and Agriculture Pests**

**Time: 3hrs**

**Maximum Marks: 60**

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**Note**

- 1. All the questions are compulsory.**
- 2. All questions carry equal marks.**
- 3. Draw well labelled diagrams and charts wherever necessary.**

**Q.1** Describe in detail the structure and functions of compound eyes. **12**  
OR

**Write notes on: -**

- (a) Bioluminescent mechanism of light producing organs.
- (b) Structure of Ocelli and stemmata .

**Q.2** Explain in detail innate immunity and molecular mechanism in insects. **12**  
OR

**Write notes on: -**

- (a) Mechanoreceptors.
- (b) Pigments and mechanism of color change.

**Q.3** Give detail account of Polymorphism, nest building and social behavior in Isoptera. **12**  
OR

**Write notes on: -**

- (a) Nest building and social behavior in ants.
- (b) Types and significance of parasitic Hymenoptera.

**Q.4** Describe in detail classification, life history, damage and control of any three pests of Cotton. **12**  
OR

**Write notes on: -**

- (a) *Bactrocera dorsalis*.
- (b) Rice weevil and Meal worm.

**Q. 5 Write in brief on the followings: -** **12**

- (a) Sound producing organs.
- (b) Chemoreceptors.
- (c) Locust migration.
- (d) Potato tuber moth.

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**M. Sc. Zoology Semester -IV (CBCS)**  
**Special Group: Fish and Fisheries -I**  
**Theory Examination Summer-2023**  
**Name of the Paper: Paper 4T2: General Studies**

**Time: 3hrs**

**Maximum Marks: 60**

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**Note**

- 1. All the questions are compulsory.**
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- 3. Draw well labelled diagrams and charts wherever necessary.**

**Q.1** Describe in detail the structure of alimentary canal in teleosts. Add a note on feeding habits. **12**

OR

**Write notes on: -**

- (a) Modification of alimentary canal in relation to feeding habits.
- (b) Osmoregulation in freshwater forms.

**Q.2** Explain in detail structure of olfactory organs. **12**

OR

**Write notes on: -**

- (a) Role of hormones in migration, orientation and navigation.
- (b) Structure and functions of taste buds.

**Q.3** Give detail account of mechanism of spermatogenesis and its hormonal control. **12**

OR

**Write notes on: -**

- (a) Structure of female reproductive system.
- (b) Structure of male reproductive system.

**Q.4** Describe in detail structure, hormones and functions of pituitary gland in fishes. **12**

OR

**Write notes on: -**

- (a) Structure, hormones and functions of thyroid gland.
- (b) Structure and functions of Pineal organ.

**Q. 5 Write in brief on the followings: -** **12**

- (a) Trunk kidney.
- (b) Periodicity of migration.
- (c) Oogenesis.
- (d) Hypothalamus.