

2025

ZOOLOGY — HONOURS

Paper : DSCC-9

(Chordate Structure and Function)

Full Marks : 75

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Group - A

1. Answer *any ten* questions : 2×10
- (a) What is retrogressive metamorphosis? Give one example of animal where it is present.
 - (b) How anus is different from cloaca?
 - (c) State two mammalian features of Monotremata.
 - (d) What is meant by pedomorphosis? Give one example.
 - (e) Write any two distinguished features of Agnatha.
 - (f) Distinguish between primary and secondary gill bars.
 - (g) State briefly the location and function of pygostyle.
 - (h) What are filoplumes? Mention its occurrence.
 - (i) Mention two important structural differences between Ratitae and Carinatae.
 - (j) What is carnassial teeth? In which animal is it found?
 - (k) Differentiate between Urodela and Anura.
 - (l) What is Monimostylic jaw suspension? Name one animal where it is present.
 - (m) Distinguish between Ductus arteriosus and Ductus caroticus.
 - (n) How pronephric kidney differs from opisthonephric kidney?
 - (o) What is meant by acoelous centrum? Where is it found?

Group - B

2. Write short notes on (*any three*) : 5×3
- (a) Accessory respiratory organs in fish
 - (b) Structure and derivatives of integuments in Amphibia

Please Turn Over

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- (c) Ruminant stomach in mammals
- (d) Poison apparatus in snake
- (e) Echolocation in Microchiropterans.

Group - C

Answer *any four* questions.

3. (a) Describe the role of endostyle in the feeding of *Branchiostoma*.
 (b) Elaborate the role of thyroid hormones in pedomorphosis of Axolotl larva.
 (c) What is bunodont teeth? Where is it found? 5+3+2
4. (a) Classify Amphibia up to living orders with examples.
 (b) Mention the functional significance of electric organ in *Torpedo*.
 (c) Distinguish between pectoral girdle of Pigeon and that of Guinea pig. 5+3+2
5. (a) Compare the anatomy of aortic arches in reptiles and birds with diagrams.
 (b) Mention the role of different muscles involved in the biting mechanism of poisonous snake.
 (c) What is diastema? 5+3+2
6. (a) Briefly explain the aerodynamics of flight in birds.
 (b) Distinguish between poisonous and non-poisonous snakes with suitable examples. 5+5
7. (a) Describe different types of skull with reference to temporal vacuities.
 (b) Draw and label the air sacs of pigeon.
 (c) Add a note on olfactory apparatus in *Tilapia*. 3+4+3
8. (a) Describe in brief, the Dipleurula concept of origin of chordates.
 (b) Distinguish between Chondrichthyes and Osteichthyes with suitable examples.
 (c) What do you mean by venous heart? Why is it called so? 5+3+(1+1)
9. (a) Describe the structure of cerebellum of birds.
 (b) State the modifications of physoclistous type of swim bladder.
 (c) State the role of notochord in Ascidian tadpole. 3+5+2

2025

ZOOLOGY — HONOURS

Paper : DSCC-10

(Endocrinology and Reproductive Biology)

Full Marks : 75

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*Candidates are required to give their answers in their own words
as far as practicable.*

Section - A

1. Answer *any ten* questions :

2×10

- (a) Distinguish between autocrine and paracrine signalling.
- (b) What is HbA1c?
- (c) What is an orphan receptor?
- (d) Distinguish between corpus luteum and corpus albicans.
- (e) Classify hormones based on their solubility.
- (f) What is atretic follicle?
- (g) What role does corpora allata play in metamorphosis of insects?
- (h) State two symptoms of Cushing syndrome.
- (i) What are second messengers? Give two examples.
- (j) State the location and function of Leydig cells.
- (k) What is reverse T₃?
- (l) Write down the full forms and functions of PVN and SON.
- (m) What is GnRH? Mention its function.
- (n) Define LH surge.
- (o) What is islet of Langerhans?

Section - B

2. Write short notes on (*any three*) :

5×3

- (a) Types of hormone receptors
- (b) Graves' disease
- (c) Feedback Mechanism of hormone action

Please Turn Over

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- (d) Zonations and hormones of adrenal cortex
 (e) Acidophils and basophils in anterior pituitary.

Section - C

Answer *any four* questions.

3. (a) Discuss the mechanism of hormone action using IP₃-DAG as the second messenger with an example.
 (b) How does hypothalamus integrate neural and endocrine signals? 6+4
4. (a) 'Interplay of insulin and glucagon maintains glucose homeostasis.' — Justify.
 (b) Distinguish between type I and type II diabetes mellitus. 5+5
5. (a) Describe the endocrine control of hypothalamo hypophyseal gonadal axis in males.
 (b) Using a flowchart, describe the process of biosynthesis of melatonin. 5+5
6. (a) How does follicular cells differ from parafollicular cells functionally?
 (b) What role does thyroxin play in fat metabolism?
 (c) How does the adrenal gland respond to stress? Add a note on adrenal hormone insufficiency. 2+3+(3+2)
7. (a) What are the different cell types present in the testis and what are their functions?
 (b) Describe the importance of blood testis barrier.
 (c) Describe, in brief, the biosynthesis of estrogen. 3+3+4
8. (a) What is the difference between hemimetabolous and holometabolous development in insects?
 (b) What is the role of PTTH in regulating ecdysone production?
 (c) Show the histological architecture of Graafian follicle with a labelled diagram. 3+3+(2+2)
9. (a) Describe the structure of a nuclear receptor with a suitable diagram.
 (b) What is parturition? Add a note on its hormonal control. (4+1)+(2+3)

2025

ZOOLOGY — HONOURS

Paper : DSCC-11

(Animal Physiology)

Full Marks : 75

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as far as practicable.*

Answer *question nos. 1 and 2* and *any four* questions from the rest (*question nos. 3-9*)

Section - A

1. Answer *any ten* questions : 2×10
- (a) What do you mean by muscular fatigue?
 - (b) Write two effects of carbon monoxide poisoning.
 - (c) Distinguish between chemical and electrical synapse.
 - (d) Mention one source and function of Gastrin.
 - (e) Define catadromous fish with example.
 - (f) What are the advantages of ureotelism?
 - (g) Define Cardiac output.
 - (h) Name any two clotting factors.
 - (i) Which antigen is present on Rh-positive red blood cells?
 - (j) What is erythroblastosis foetalis?
 - (k) Define hibernation. Give an example.
 - (l) Distinguish between R and T forms of haemoglobin.
 - (m) Distinguish between chyme and chyle.
 - (n) Define Platelet Plug.
 - (o) State the role of ADH in urine formation.

Section - B

2. Write short notes on (*any three*) : 5×3
- (a) Juxta Glomerular apparatus
 - (b) Urea cycle

Please Turn Over

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- (c) Synaptic transmission in a chemical synapse
- (d) Cardiac Cycle
- (e) Oxygen Dissociation curve.

Section - C

3. (a) Mention the ovarian follicular phase of Menstrual cycle.
(b) Explain the role of pituitary hormones in regulating the menstrual cycle.
(c) Write a short note on vaginal changes during the estrous cycle. 4+2+4
4. (a) Mention the mechanism of urine concentration by counter current mechanism.
(b) Describe the process of osmoregulation in marine elasmobranch. 6+4
5. (a) Describe the process of excitation-contraction-coupling in muscle contraction with properly labelled diagrams.
(b) What are the roles of calcium ions and ATP in muscle contraction? 6+4
6. (a) Write carbon dioxide transportation in blood from tissue to lung with special reference to chloride shift.
(b) Write a short note on process of RAAS involved in sodium and water balance. 5+5
7. (a) Illustrate the mechanism of chemical digestion of lipids in Human digestive system.
(b) Explain mechanical digestion in the mouth and stomach.
(c) Write a short note on absorption of amino acids. 4+4+2
8. (a) Write a short note on the conducting system of the human heart with diagram.
(b) Define vital capacity and mention its normal value. (4+2)+4
9. (a) Write a short note on thermoregulation in polar bear.
(b) Describe the ionic basis of depolarization during an action potential.
(c) Write a short note on saltatory conduction. 4+4+2

2025

ZOOLOGY — HONOURS

Paper : DSCC-12

(Biodiversity and Conservation Biology)

Full Marks : 75

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Candidates are required to give their answers in their own words as far as practicable.

Section - A

1. Answer *any ten* questions : 2×10
- (a) What is Inbreeding Depression?
 - (b) What is alpha diversity?
 - (c) Define Protected Area Network.
 - (d) Define Shannon Diversity Index.
 - (e) What do you mean by genetic diversity?
 - (f) Define endangered species with an Indian example.
 - (g) Name two critically endangered species of India.
 - (h) Define Umbrella species with an Indian example.
 - (i) Mention two major causes of habitat fragmentation.
 - (j) What are exotic species? Give example.
 - (k) Define Population Viability Analysis (PVA).
 - (l) Define vulnerable species. Give one Indian example.
 - (m) Define captive breeding.
 - (n) What is the objective of the Biosphere Reserve programme?
 - (o) What is CITES and why is it important?

Section - B

Answer *question no. 2* and *any four* from the rest.

2. Write short notes on (*any three*) : 5×3
- (a) Biodiversity values
 - (b) Wildlife Protection Act, 1972

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- (c) Project Tiger
- (d) Peoples' Biodiversity Register
- (e) β and γ diversity.
3. Mention any two characteristics of megadiversity countries. Define endemism. State the importance of flagship species in conservation programme. What do you mean by functional diversity? 2+2+3+3
4. Define climate change. Compare between in-situ and ex-situ conservation. Name any two biodiversity hotspots in India. Name one mammal and one bird belonging to Schedule-I. 2+4+2+2
5. Name any two Wildlife Sanctuaries from West Bengal. Mention two objectives of the Protected Area Network. Differentiate between Wildlife Sanctuary and Biosphere Reserve. What do you mean by Community Reserve? Give one example. 1+2+3+3+1
6. State any three threats associated with wildlife in India. Describe any one human-wildlife conflict scenario from India. Discuss methods of mitigating human-wildlife conflict. 3+3+4
7. What is captive breeding? State the disadvantages of captive breeding. Mention the challenges faced in reintroduction programs. Explain the process of reintroduction. 2+2+3+3
8. Discuss the importance of gene bank and cryopreservation in ex-situ conservation. Write a short note on Joint Forest Management. Explain the role of local communities in biodiversity conservation. (2+2)+3+3
9. Define wildlife corridor. State two advantages and two disadvantages associated with wildlife corridor. Briefly explain the IUCN categories of threatened species. 2+(2+2)+4