[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1209 **F**

Unique Paper Code : 2232041201

Name of the Paper : Non-Chordata: Coelomates

Name of the Course : **B.Sc. (H) Zoology- UGCF**

Semester : II

Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Answer any **FOUR** questions in all.
3. **Question No. 1** is compulsory.
4. Draw well-labelled diagrams wherever necessary.

1. (i) Define the following terms (any four): (4)

   (a) Ecdysis

   (b) Epitoky

P.T.O.

(c) Pseudo-metamerism

(d) Ocelli

(e) Tagmosis

(ii) Differentiate between the following (any two): (4)

(a) Schizocoelous and Enterocoelous

(b) Septal and pharyngeal nephridia

(c) Tracheal gills and book gills

(iii) Give the location and function of the following (any four): (4)

(a) Malphigian gland

(b) Radula

(c) Tiedmann's body

(d) Statocyst

(e) Typhlosole

(iv) Give generic of the following and classify upto classes (any three): (3)

(a) Brittle star

(b) Water flea

(c) Clamp worm

(d) Tusk shell

2. (a) Give an account on the social life of Honey bee and add note on their economic importance.

(b) Describe the evolution of Metamerism. (9+6)

3. (a) Explain the mechanism of Torsion and detorsion in Gastropoda.

(b) Give the detailed description of excretion in Annelida with diagrams. (9+6)

4. (a) Discuss the water-vascular system in Asteroidea and write about its significance.

(b) Explain the process of Pearl formation in bivalves. (9+6)

5. (a) Give the brief account on respiratory organs. in Arthropods and discuss the mechanism of respiration in insects.

(b) What is Mosaic vision? Describe the functioning of compound eye of Arthropods in different intensities of light. (9+6)

6. Write short notes on the following: (15)

(a) Evolutionary significance of Onychophora

(b) Types of metamorphosis

(c) General characteristics of Mollusca

Sl No of QP : 4563 *Roll No.....*

Unique paper code : 32231201

Name of the paper : Non-Chordata-II: Coelomates

Name of the course : B.Sc. (HONS.) ZOOLOGY

Semester : II

Maximum Marks : 75

Time : 3 Hours

(Write your Roll No. on the top immediately on receipt of this question paper)

Answer **Five** questions in all.

Question No.1 is compulsory.

Q1. (a) Define: **1x5=5**

(i) Tagmosis
(ii) Ecdysis
(iii) Trophallaxis
(iv) Detorsion
(v) Epitoky

(b) Name the phylum in which the following structures are present and give one function of each: **1x4=4**

(i) Osphradium
(ii) Pedicellaria
(iii) Ocellus
(iv) Typholosole

(c) Differentiate between the following terms, giving examples: **2x3=6**

(i) Book lungs and Book gills
(ii) Brachiolaria and Ophiopleutus larvae
(iii) Apposition and Superposition image

(d) Give the scientific names and classify upto classes giving distinguishing characteristics of each category: **2x4=8**

(i) King crab
(ii) Paddle worm
(iii) Devil fish
(iv) Brittle star

(e) Match the following: 4

(i) Mollusca	(a) Soldier
(ii) Leech	(b) Doliolaria
(iii) Nasute	(c) Mantle
(iv) Echinoderm	(d) Ectoparasite

Q2. What is meant by Eusociality? Discuss social organisation in any **one** insect. **12**

Q3. (a) Explain the structure of gills in Mollusca and discuss the mechanism of respiration in Gastropods. **8**

(b) How does pearl formation occur in Bivalves? **4**

Q4. Describe the Water Vascular System in Asterias with the help of labelled diagrams. Add a note on its functional role in locomotion. **12**

Q5. (a) Give an account of metamorphosis in Insects and discuss its hormonal control **8**

(b) Discuss the affinities of Echinoderms with chordates. **4**

Q6. (a) Draw neat labelled diagrams of the excretory organs of Annelids and explain their working. **8**

(b) Justify the statement that *Peripatus* is a connecting link between Annelida and Arthropoda **4**

Q7. (a) Discuss torsion in gastropods **6**

(b) Explain the structure of compound eye and types of vision in Arthropods **6**

Q8. Write short notes on **any three** of the following: **3x4=12**

(a) Metamerism

(b) Tracheal respiration in Insects

(c) Structure of the compound eye

(d) Evolutionary significance of Trochophore

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper	:	**4535**	**E**
Unique Paper Code	:	32231401	
Name of the Paper	:	Comparative Anatomy of Vertebrates	
Name of the Course	:	**B.Sc (H) Zoology**	
Semester/Annual	:	IV	

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Answer **five** questions in all.
3. **Question no. 1** is compulsory.

1. (a) Define **any five** of the following terms: (1×5=5)

   (i) Dermatocranium

   (ii) Neuromast Organs

   (iii) Procoelous

   (iv) Archinephros

   (v) Venous heart

P.T.O.

(vi) Holocrine

(b) Distinguish between any Five of the following: (2×5=10)

(i) Larynx and Syrinx

(ii) True horns and Antlers

(iii) Contour and Down feathers

(iv) Rod and Cone cells

(v) Single circulation and double circulation

(vi) Spinal and cranial nerves

(c) State exact location and function of the following: (2×4=8)

(i) Preen gland

(ii) Jacobson's organ

(iii) Carnassial tooth

(iv) Meibomian gland

(d) State whether following statements are true or false: (1×4=4)

(i) Sebaceous glands of mammals are apocrine

(ii) Placoid scales are epidermal derivatives.

(iii) Craniostylic jaw suspension is found in fishes.

(iv) Gizzard is the part of bird stomach.

2. Explain the anatomical details of heart in different vertebrates and draw suitable diagrams. (12)

3. (a) Discuss the succession of kidney among vertebrates with suitable diagrams. (6)

(b) Describe various types of uteri found in mammals with suitable diagrams. (6)

4. Describe the various parts of brain. Compare the brain anatomy of reptiles and mammals. (12)

5. (a) Compare the anatomy of digestive tract among amniotes. Draw required diagrams also. (6)

(b) Classify and give functions of various types of receptors found in vertebrates. (6)

6. (a) Explain the anatomy of avian lung with the help of diagrams and give the mechanism of respiration in birds. (6)

(b) Describe the structure of integument in vertebrates. Draw appropriate diagrams also. (6)

P.T.O.

7. Write the short notes on **any three** of the following. (3×4=12)

(a) Internal ear

(b) Accessory Respiratory organs

(c) Visceral arches

(d) Scales in fishes

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4690 **E**

Unique Paper Code : 32231402

Name of the Paper : Animal Physiology: Life Sustaining Systems

Name of the Course : **B.Sc (Hons.) Zoology**

Semester : IV, LOCF

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **FIVE** QUESTIONS in all.
3. Question no. **1** is COMPULSORY.
4. Draw diagrams wherever necessary.

1. (a) Define the following terms : (4)

   (i) Stroke Volume

   (ii) Plasminolysis

   (iii) Ultrafiltration

P.T.O.

(iv) Hering Breuer reflex

(b) Differentiate between the following : (10)

(i) Cortical and juxtamedullary nephron

(ii) Granulocytes and agranulocytes

(iii) Respiratory acidosis and metabolic acidosis

(iv) Salivary amylase and pancreatic amylase

(v) Tricuspid valve and bicuspid valve

(c) Expand the following abbreviations : (2)

(i) GIP

(ii) ANP

(iii) GFR

(iv) EDV

(d) State the *location* and *function* of the following **(Any FOUR)** : (4)

(i) Podocytes

(ii) Type II alveolar cells

(iii) K cells

(iv) Carotid bodies

(v) Chordae tendineae

(e) Fill in the blanks :– (4)

(i) Respiratory pigment present in the muscle is known as _____

(ii) Facultative reabsorption of water occurs only in the _____ of kidney.

(iii) Gastrin stimulates the secretion of _____

(iv) The chamber of the heart with thickest myocardium is _____

(f) Draw a detailed structure of nephron. (3)

2. (a) Discuss in details the mechanism of oxygen transport in blood.

(b) Comment on Oxygen-hemoglobin dissociation curve. (8,4)

3. (a) Discuss the hormonal regulation of tubular reabsorption and secretion.

(b) Explain the pathway of renal blood supply. (8,4)

4. (a) Describe the extrinsic and intrinsic pathway of blood clotting.

(b) What is cardiac output? Explain the factors that regulate stroke volume. (8,4)

5. (a) Give a detailed account of mechanical and chemical digestion in the stomach.

(b) Write a note on the portal triad. (9,3)

6. (a) Describe the events of the cardiac cycle, along with the diagrams.

(b) Explain the components of a normal ECG. (9,3)

7. Write short notes on Any **THREE** of the following : (3×4=12)

(a) Structure and functions of haemoglobin

(b) Juxtaglomerular apparatus

(c) Coronary circulation

(d) Chloride shift

(e) Absorption of carbohydrates in small intestine.

(1000)

(14)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4815 **E**

Unique Paper Code : 32231403

Name of the Paper : Biochemistry of Metabolic Processes

Name of the Course : **B.Sc. (Hons.) Zoology-LOCF**

Semester : VI

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions including.
3. Question No. **1**, which is compulsory.

1. (a) Define the following terms : (1×7=7)

   (i) Chemiosmosis

   (ii) ω - Oxidation

   (iii) Shuttle system

P.T.O

(iv) Coupled reactions

(v) Acidosis

(vi) Amphibolic pathway

(vii) Transketolase

(b) Differentiate between the following pairs of terms : (5×2=10)

(i) Transamination and oxidative deamination

(ii) Oxidative phosphorylation and substrate-level phosphorylation

(iii) Glucokinase and hexokinase

(iv) Catabolism and anabolism

(v) Cofactor and Coenzyme

(c) Expand the following terms : (1×5=5)

(i) FAS

(ii) PLP

(iii) HMP

(iv) PFK

(v) HMG

(d) Name the cofactor/coenzyme required for the following enzymes : (1×5=5)

(i) Pyruvate dehydrogenase

(ii) Hexokinase

(iii) Citrate synthase

(iv) Pyruvate kinase

(v) Cytochrome oxidase

2. With the help of chemical structures, illustrate the metabolism of glucose to pyruvate. Add a note on significance of glucose metabolism for a cell. (9+3=12)

3. How highly toxic nitrogenous waste generated from amino acid metabolism in peripheral organs is converted into less toxic nitrogenous waste? Explain the process in detail using structural formulae. (12)

4. (a) Describe the catabolic reactions for the breakdown of glycogen in liver cells. (4)

(b) Explain the β-oxidation of an even numbered saturated fatty acid. (8)

P.T.O.

5. (a) Give a detailed account of biosynthesis of palmitic acid. (8)

(b) Illustrate the mechanism involved in generating ATP from reducing equivalents. (4)

6. (a) Describe tricarboxylic acid cycle. (8)

(b) What are the sources and fates of ketone bodies? (4)

7. Write short notes on **any three** of the following : (4×3=12)

(a) Gluconeogenesis

(b) Cori cycle

(c) ATP synthase

(d) Compartmentalization of metabolic pathways in a cell

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4517 **E**

Unique Paper Code : 32231601

Name of the Paper : Developmental Biology

Name of the Course : **B.Sc. (H) Zoology Examination, LOCF**

Semester : VI

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions in all including Question No. **1** which is compulsory. Illustrate your answers with diagrams, wherever necessary.

1. (a) Define the following : (6×1.5=9)

   (i) Amphimixis

   (ii) Capacitation

   (iii) Primitive streak

P.T.O.

(iv) Blastema

(v) Vitellogenesis

(vi) Fertilization membrane

(b) Differentiate between the following : (5×2=10)

(i) Subgerminal and segmentation cavity

(ii) Blastula and gastrula

(iii) Splanchnopleure and somatopleure

(iv) Cleidoic and non-cleidoic eggs

(v) Progenesis and neoteny

(c) Name the germ layer/s from which each of the following is derived. (5)

(i) Lungs

(ii) Adrenal medulla

(iii) Kidney

(iv) Heart

(v) Retina

(d) Give the contribution of the following scientists in the field of developmental biology (**any three**). (3)

(i) Walter Vogt

(ii) J.F. Gudernatsch

(iii) Robert Edwards

(iv) E. Conklin

2. (a) Compare the inward movement of prospective mesoderm and endoderm cells in frog and chick. (7)

(b) Describe different types of animal eggs based on amount and distribution of yolk. (5)

3. (a) Describe the process of implantation of embryo in humans. (9)

(b) What is ART? Write a note on the Embryonic Stem Cells. (3)

4. (a) Discuss in detail the hormonal control of metamorphosis in insects. (6)

(b) Explain the three modes of regeneration in animals with suitable examples. (6)

P.T.O.

5. (a) Explain external fertilization in sea urchin. State the importance of sea water pH levels and Resact molecules with respect to the sperm motility. (7)

(b) How does the internal fertilization in rat differ from the external fertilization in sea urchin. (5)

6. (a) Describe the process of neurulation in detail. (9)

(b) Briefly describe the role of dorsal lip of blastopore as a primary organizer. (3)

7. Write short notes on *any* **three** of the following : (3×4=12)

(a) Fate map

(b) Hormonal disruptors as teratogens

(c) Theories of Ageing

(d) Amniocentesis

(e) Cortical reaction

(f) Spermatogenesis

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1228 **F**

Unique Paper Code : 2232011202

Name of the Paper : Fundamentals of Biomolecules

Type of the Paper : DSC

Name of the Course : **B.Sc.(Hons) Zoology**

Semester : II

Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any four question including Question No. 1 which is compulsory.
3. Draw well-labelled diagrams wherever necessary.

1. (i) Define the following terms **(any four)** (4)

(a) Muta-rotation

P.T.O.

(b) Eicosanoids

(c) Zwitterion

(d) Nucleotides

(e) Isozyme

(ii) Differentiate between (any two) (4)

(a) B DNA and Z DNA

(b) Aldose and Ketose

(c) Reducing and Non—reducing sugar

(iii) Draw the structure of (3)

(a) Palmitic acid

(b) Phenylalanine

(c) Galactose

(iv) Explain why (2×2=4)

(a) Saturated fatty acids have high melting point?

(b) Absorbance at 260 nm increases when we denature DNA?

2. (a) Describe the levels of organization in proteins. (10)

(b) Add a note on general properties of amino acids. (5)

3. (a) Explain the structure of B-form of DNA with suitable diagrams. (8)

(b) Add a note on Cot curves and their significance. (7)

4. (a) Elucidate the Michaelis-Menten equation for one enzyme one substrate reaction. (12)

(b) Briefly describe the irreversible enzyme inhibitions. (3)

5. (a) Give detailed account of structure and function of polysaccharides. (8)

(b) Describe the structure of Phospholipids and Glycolipids with suitable diagrams. (7)

6. Write short notes on **(any three)** (5×3=15)

(a) Steroids

(b) Glycoconjugates

(c) Lineweaver Burk plot

(d) Types of RNA

[This question paper contains 4 printed pages.]

Your Roll No....4.....

Sr. No. of Question Paper : 1247 **F**

Unique Paper Code : 2232011203

Name of the Paper : Human Physiology: Control and Coordination Systems/ Discipline Specific Core- 6

Name of the Course : **B.Sc (Hons) Zoology Exam-2023**

Semester : II-(NEP-UGCF)

Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **FOUR QUESTIONS** in all and **Question no. 1** is COMPULSORY.
3. Draw well labelled diagram wherever necessary

1. (a) Define the following **(Any Four):** (4)

(i) Saltatory conduction

P.T.O.

(ii) TRIAD

(iii) Permissive effect

(iv) Implantation

(v) Motor Unit

(b) Differentiate between the following: (4)

(i) Absolute vs Relative refractory period

(ii) Granulosa vs Thecal cells

(c) Give the location and function of the following: (3)

(i) Fascia

(ii) Corpus luteum

(iii) Principal cells

(d) Expand the following: (2)

(i) IPSP

(ii) ICSH

(iii) BMR

(iv) PRL

(e) Match the following: (2)

1. Myosin	(a) Axon
2. Nissl granules	(b) A band
3. Tropomyosin	(c) Calcitonin
4. Parafollicular cells	(d) I band

2. (a) How is blood-testes barrier important? Giving the functions of Leydig and Sertoli cells explain the key events in spermatogenesis. (10)

(b) Describe the various types of muscle proteins. (5)

3. (a) Describe the events occurring at the neuromuscular junction (8)

(b) Explain the muscle contraction cycle. (7)

4. (a) Diagrammatically illustrate the different layers of adrenal gland. Enumerate the hormones secreted and describe their functions. (10)

(b) Explain the mode of action of water soluble hormone. (5)

5. (a) Outline the major events of uterine cycle and correlate them with ovarian events (10)

(b) Diagrammatically represent folliculogenesis in ovary. (5)

6. Write short notes **(any three)** (3×5=15)

(i) Hypothalamo-hypophyseal Portal System

(ii) Hormonal control of testicular function

(iii) Ultrastructure ofa Sarcomere

(iv) Generation of action potential in neuron

(v) Synthesis and Secretion of thyroid hormones