

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1385

C

Unique Paper Code : 32231301

Name of the Paper : Diversity of Chordates

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

Semester : III

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 FIVE questions in all.
 3. Question No.1 is compulsory.
 4. Illustrate your answers with diagram wherever necessary.
-
1. (a) Give the scientific name and classify each of the following upto order :
 - (i) Sea squirt
 - (ii) Midwife toad
 - (iii) Glass snakes

P.T.O.

(iv) Sea horse

(4×1½=6)

(b) Differentiate between :

(i) Physostomous and Physoclistous swim bladder

(ii) Lacertilia and Ophidia

(iii) Ratitae and Carinatae

(iv) Tornaria and Ascidian tadpole larva

(4×2=8)

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

(i) Gas gland

(ii) Uropygial gland

(iii) Patagium

(iv) Loreal pit

(4×1½=6)

(d) Mark the following statements as TRUE or FALSE :-

(i) Balanoglossus is a ciliary feeder.

(ii) Swim bladder is present in Elasmobranch.

- (iii) Excretion in amphibians is ureotelic.
- (iv) All the reptiles have diapsid skull.
- (v) Presence of pygostyle helps the birds for stability in air.
- (vi) Metatherians are oviparous. (6×1/2=3)

(d) Explain :

- (i) Paedogenesis
- (ii) Cursorial adaptation
- (iii) Lateral Line
- (iv) Realm (4×1=4)

2. Give a detailed account of migratory behavior of birds. (12)

3. (a) What are the reasons for considering *Sphenodon* as a connecting link between amphibians and reptiles? (8)

(b) Describe the catadromous migration in fishes with suitable example. (4)

4. Explain the origin and evolution of Tetrapods. (12)
5. Elaborate the mechanism of maintaining the internal balance of salt and water in various groups of fishes that help them adapt to their habitats. (12)
6. (a) Describe the salient features and fauna of Palearctic and Oriental regions. (8)
(b) Explain the biting mechanism of poisonous snakes. (4)
7. Write short note on **ANY THREE** of the following :
 - (i) Continental drift theory
 - (ii) Reptilian affinity of Prototherians
 - (iii) Echinoderm theory of origin of chordates
 - (iv) Retrogressive metamorphosis (3×4=12)

2

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1414

C

Unique Paper Code : 32231302

Name of the Paper : Physiology: Controlling and Coordinating Systems

Name of the Course : B.Sc. (Hons.) Zoology Exam-2022, LOCF

Semester : III

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 **Five** questions in all. Question no. 1 is compulsory.
3. Draw diagrams wherever required.

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

(i) Synapse

(ii) Osteoporosis

P.T.O.

(iii) Tropic hormone

(iv) Epiphyseal plates

(b) Differentiate between the following : (10)

(i) Diabetes mellitus and Diabetes insipidus

(ii) Isotropic and anisotropic band

(iii) Spermatogenesis and spermiogenesis

(iv) Compact and spongy bone

(v) Somatotropin and somatostatin

(c) Expand the following (**any FOUR**) : (4)

(i) ICSH

(ii) PIF

(iii) hGH

(iv) IPSP

(v) ACTH

(vi) NOS

(d) Give the location and function of the following:

(5)

- (i) Chromaffin cells
- (ii) Corpus luteum
- (iii) T- tubules
- (iv) Leydig cells
- (v) Volkmann's canal

(e) Fill in the blanks :

(4)

- (i) Oxygen-binding protein found only in the muscle fibres is _____
- (ii) Ligand-gated ion channels are present in _____
- (iii) Simple columnar epithelium is specialised for _____ and _____

2. Compare the conduction of an action potential in a non-myelinated axon with that in a myelinated one. Which type of conduction is more energy-efficient and why? (9+3)

3. (a) Describe the mode of action of lipid soluble and water-soluble hormones. Give suitable examples for each. (8)
- (b) List the hormones secreted from the posterior pituitary and describe their functions. (4)
4. (a) Discuss the molecular basis of skeletal muscle contraction. (10)
- (b) What are ionotropic receptors? (2)
5. (a) How are sound waves converted into action potentials in the auditory nerve? (9)
- (b) Draw a well labelled diagram of a neuron. (3)
6. (a) Discuss the role of different hormones involved in the male reproductive physiology. (6)
- (b) Describe the functions of Sertoli cells. (6)
7. Write short notes on **any three** of the following :
- (a) Renin-Angiotensin-Aldosterone (RAA) pathway
- (b) Cell junctions
- (c) Types of cartilage
- (d) Oogenesis (3×4=12)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1432

C

Unique Paper Code : 32231303

Name of the Paper : Fundamental of Biochemistry

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

Semester : III

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 **FOUR** questions in all.
3. Question No. 1 is compulsory.

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

- (i) Eicosanoids
- (ii) Epimer
- (iii) Amphipathy

- (iv) Isozymes
- (v) Pitch of the DNA
- (vi) Plasmalogens
- (vii) pKa value

(b) Differentiate between the following pairs of terms :
(6×2 =12)

- (i) Cysteine and Cystine
- (ii) Hemiacetal and Hemiketal
- (iii) Nucleoside and Nucleotide
- (iv) Cofactor and Coenzyme
- (v) Peptide and Glycosidic bond
- (vi) Phi and Psi angle

(c) Give the names and structures of the following:
(4×2=8)

- (i) A disaccharide composed of glucose and fructose
- (ii) An amino acid with aromatic R group

(iii) A purine nitrogenous base

(iv) A saturated C-16 fatty acid

2. (a) Describe various forms of DNA with special reference to Watson and Crick Model? (8)
- (b) Explain the C_0t -curves analysis with the help of graph. (4)
3. (a) Give an account on the structural and functional features of phospholipids. (7)
- (b) Describe the physiological importance of saturated and unsaturated fatty acids. (5)
4. (a) Elucidate the Michaelis-Menten equation for a one enzyme one substrate reaction. (7)
- (b) What factors are responsible for affecting the enzyme activity. Discuss. (5)
5. (a) Explain various levels of organization of protein structure and their significance. (9)
- (b) What are essential and non-essential amino acids? Cite the examples. (3)

6. (a) Give a detailed account of 'structure and function of any two homo and hetero polysaccharides.

(8)

(b) Describe the structural properties of Monosaccharides.

(4)

7. Write short notes on any **three** of the following :

(4×3=12)

(i) Lineweaver-Burk Plot

(ii) Immunoglobulins

(iii) Cholesterol

(iv) induced fit theory of Enzyme action

(v) t-RNA

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1018

Unique Paper Code : 32231501

Name of the Paper : Molecular Biology

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

Semester : V

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. Question No.1 is compulsory.
3. Attempt five questions in all.
4. Draw neat, labelled diagrams wherever necessary.

I. (a) Define the following terms : (1×5=5)

(i) Replication fork

(ii) Exon shuffling

(iii) Enhancer

(iv) Polyribosome

P.T.O.

(v) Riboswitches

(b) Expand the following :

(0.5×6=3)

(i) cccDNA

(ii) TRCF

(iii) MSH

(iv) MTE

(v) ITS

(vi) ORC

(c) State the function of the following :

(1×5=5)

(i) TATA Box

(ii) TF II D

(iii) Shine-Dalgarno Sequences

(iv) RNase P

(v) Telomerase

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

(i) Leading and Lagging strands

(ii) RNA polymerase II and RNA polymerase III

(iii) A-site and P-site

(iv) Promoter and Operator

(v) miRNA and siRNA

(e) State the best-known contribution of the following scientists : (1×4=4)

(i) Roger Kornberg

(ii) Charls Yanofsky

(iii) Robert William Holley

(iv) Phillip Allen Sharp

2. Compare and contrast the process of transcription in prokaryotes and eukaryotes. (12)

3. (a) Discuss the process of activation of amino acids and formation of initiation complex in prokaryotes. (8)

(b) Describe the salient features of Genetic code. (4)

(a) Describe the sequence of events during DNA Replication in eukaryotes while explaining the role of various proteins involved in it. (8)

(b) Explain the Rolling circle replication in bacteria with suitable illustration. (4)

5. (a) Explain how the deletion of the following features would affect a eukaryotic pre-mRNA? (6)
- (i) AAUAAA consensus sequence
 - (ii) 5' cap
 - (iii) Poly(A) tail
- (b) Explain (with illustration) the regulation of *Lac* operon. (6)
6. (a) Describe the structure of Globin Gene and explain the molecular mechanism of splicing. (8)
- (b) One gene may code for more than one polypeptide in eukaryotes. Justify the statement. (4)
7. Write short notes on the followings (any three): (3×4=12)
- (i) Structure of tRNA
 - (ii) RNA interference
 - (iii) Mismatch Repair
 - (iv) Synthesis of rRNA

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1265

C

Unique Paper Code : 32237909

Name of the Paper : Immunology

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

Semester : V (CBCS)

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 Five questions in all. Question No. 1 is compulsory.
3. Attempt all the parts of a question together.

1. (a) Define :

(i) Opsonin

(ii) Avidity

(iii) Adjuvant

(iv) Anaphylatoxin

(v) Hematopoiesis

(1×5)

P.T.O.

(b) Differentiate between the following :

- (i) Active and Passive Immunity
- (ii) Primary and Secondary Immune response
- (iii) Exogenous and Endogenous antigens
- (iv) Polyclonal and Monoclonal Sera
- (v) Innate and Adaptive Immunity (2×5)

(c) Write the contribution/s of the following scientists :

- (i) Cesar Milstein and Georges E. Köhler
- (ii) Jules Bordet (1×2)

(d) Expand the following :

- (i) HLA
- (ii) GM-CSF
- (iii) ADCC
- (iv) MAC
- (v) RIA
- (vi) CDR (1/2×6)

(e) Write the immunological significance of the following

- (i) Interferons
- (ii) Bursa of Fabricius
- (iii) CLIP
- (iv) Rheumatoid Factor (1×4)

(f) Give reasons :

- (i) Burn victims are more prone to infections.
- (ii) IgA survives the proteolytic degradation in GI tract.
- (iii) Self antigens do not produce immune response in normal persons. (1×3)

2. (a) Describe the basic structure of an antibody. How was the structure of antibody deduced.

(b) Differentiate between T cell and B cell epitopes. (8,4)

3. (a) Describe Gell and Coomb's classification of hypersensitivity with suitable examples.

(b) Describe the process of Hematopoiesis with a diagram with examples from myeloid and lymphoid lineages. (6,6)

P.T.O.

4. (a) Differentiate between primary and secondary lymphoid organs. Write a note on structure and function of Lymph Node.
- (b) Briefly discuss major types of vaccines with appropriate examples. (6,6)
5. (a) Describe the formation of MAC through classical pathway of complement activation.
- (b) What is a hapten? Describe the factors which determine immunogenicity. (6,6)
6. (a) Illustrate and discuss the cytosolic pathway for processing antigen.
- (b) How Clonal Selection theory justifies the four cardinal features of adaptive immune response? (6,6)
7. Write short notes : (Any Three)
- (a) Innate Immune barriers
- (b) Immunodeficiency
- (c) Cytokines
- (d) Antigen- Antibody interaction as tools in Research and diagnosis (4×3)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1032

D

Unique Paper Code : 2232011101

Name of the Paper : Non Chordata-Protista to
Pseudocoelomates (DSC-1)

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

Semester : I

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 including Question No. 1 which is compulsory.
3. Draw well-labelled diagrams wherever necessary.

P.T.O.

1032

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

(a) Eutely

(b) Polyembryony

(c) Cyclosis

(d) Metaboly

(e) Apolysis

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

(a) Trophocytes and Thesocytes

(b) Definitive host and Intermediate host

(c) Gonozoid and Gastrozoid

(iii) State whether following statements are true or false: (4)

(a) Malarial parasite is a digenetic organism.

(b) The totipotent cells of sponges are the archeocytes.

(c) Siphonophore cnidarians exhibit polymorphism.

(d) *Taenia solium* has a well-developed digestive system.

(iv) Give generic names of the following and classify up to class (**any three**): (3)

(a) Glass rope sponge

(b) Slipper animalcule

(c) Organ pipe coral

(d) Jelly fish

2. (a) Mention the types of locomotor organelles in Protozoa. Explain briefly how they bring about locomotion.

(b) Describe the various modes of asexual reproduction in Protozoa. (9+6)

3. What are coral reefs? Write all you know about coral formation mentioning clearly various forms of coral reefs met with all over the world. (15)

4. (a) Give a detailed account of the criteria on the basis of which Non-Chordates have been classified.

(b) Give general characteristics of phylum Ctenophora.

(10+5)

5. (a) Describe the life cycle of *Ascaris lumbricoides* with the help of labelled diagrams.

(b) Give its physiological adaptations towards parasitic mode of life. (10+5)

6. Write short notes on any three of the following:

(15)

(a) Polymorphism in Hydrozoa

(b) Structure and function of types of cells in sponges

(c) Syconoid canal system

(d) Sporogony

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1072

D

Unique Paper Code : 2232011103

Name of the Paper : DSC-3, Concepts of Ecology

Name of the Course : B.Sc. (Hon) Zoology

Semester : I 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 four questions in all.
3. Question no. 1 is compulsory.

1. (a) Define the following:

(4)

(i) Guilds

P.T.O.

(ii) Ecosystem

(iii) Ecological efficiency

(iv) Keystone species

(b) Distinguish between the following: (6)

(i) Grazing and detritus food chain

(ii) Amensalism and Commensalism

(iii) Autogenic and Allogenic succession

(c) Fill in the blanks: (2)

(a) _____ is a type of biological interaction where one species causes harm to another organism without any harm or benefits to itself.

(b) _____ life tables are the most accurate types of life tables.

(d) Name the scientists associated with the following terms: (3)

(i) Competitive exclusion principle

(ii) Ecology

(iii) Life Table

2. (a) Describe density dependent regulation of a population. (7)
- (b) Briefly describe Shelford's Law of Tolerance with the help of suitable examples. (4)
- (c) Elaborate the differences between autecology and synecology (4)
3. (a) Describe various possible outcomes of inter-specific competition with graphical representation and equations. (9)
- (b) Differentiate between r-selected and k-selected species. (6)
4. (a) Define ecological succession? Give the differences between pioneer and climax community. (6)
- (b) Explain the phenomenon of primary succession in a community with an example. (9)
5. (a) What are Biogeochemical cycles? Explain the role of micro-organisms in Nitrogen cycle. Along with a neat labelled diagram of Nitrogen cycle (10)

(b) Define Food chain. Explain the difference between Linear and Y-shaped food chain, with examples.

(5)

6. Write short notes on any three of the following:

(3 × 5)

- (a) Light as a limiting factor
- (b) Ecological Pyramids
- (c) Types of species interactions
- (d) Survivorship curves
- (e) Ecotone and edge effect
- (f) Vertical stratification in forests

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1158

Unique Paper Code : 32237901

Name of the Paper : DSE- Animal Behaviour and
Chronobiology

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

Semester : V 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 Five questions in all including Question No. 1 which is compulsory.
-
1. (a) Define the following :
 - (i) Phase
 - (ii) Reinforcement
 - (iii) Supernormal stimulus
 - (iv) Code breakers

P.T.O.

- (v) Innate behaviour
- (vi) Ethogram

(1×6=6)

(b) Differentiate between the following :

- (i) Tropotaxis and klinotaxis
- (ii) Habituation and sensitization
- (iii) Alpha male and subordinate male
- (iv) Ultradian and infradian rhythm
- (v) Classical and Operant conditioning
- (vi) Allomones and kairomones

(2×6=12)

(c) Give Contributions of following :

- (i) Wallace Craig
- (ii) Ivan Pavlov
- (iii) Niko Tinbergen
- (iv) Karl von Frisch

(1×4=4)

(d) State true or false :

- (i) Imprinting takes place during a narrow window of time shortly after birth.
- (ii) Genetic makeup and physical characteristics of animals are adaptations over time to the environment they are raised in.

(iii) Animals that have parental care produce more offspring than animals without parental care.

(iv) An example of kin selection is that peacocks have long, showy tails even though it makes them more obvious to predators and more difficult to fly.

(v) Round dance performed by honeybees has no directional component. (1×5=5)

2. (a) Give an account of photic and non photic zeitgebers. (6)
- (b) Explain the adaptive significance of biological clock. (6)
6. (a) Explain proximate and ultimate causes of behavior with help of suitable examples. (6)
- (b) Explain intersexual selection. Why is it advantageous for species? (6)
4. (a) Describe various methods of studying and recording animal behaviour. (6)
- (b) Explain sexual dimorphism and its role in mate choice. (6)

5. (a) Explain the importance of Tinbergen's four questions in the modern study of animal behavior. (6)

(b) What do you understand by social behavior and explain its advantage and disadvantages. (6)

6. (a) Explain the role of hormones in honeybee society. (6)

(b) Give the characteristics of a reflex action. Discuss their corresponding complex behavior patterns. (6)

7. Write short notes on any **three** of the following :

(a) Classical conditioning

(b) Selfish gene

(c) Territorial behaviour

(d) Polyethism

(e) Parasitic brood care

(3x4=12)