

Total Number of Pages—6

I-CC—Zoo-I

2023

ZOOLOGY

(Non-Chordates-I : Protista to Pseudocoelomates)

[Honours]

Paper — CC-ZOO-I

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

Draw diagrams wherever necessary

PART — I

1. Fill in the blanks :

1 × 8

(a) Growing or Feeding stage of *Entamoeba histolytica* is called _____.

(Turn Over)

(2)

- (a) Osmoregulation in Amoeba is controlled by _____.
- (c) Defensive polyps are called _____.
- (d) Ctenophora are commonly known as _____ due to the presence of eight comb like plates for locomotion.
- (e) Onchosphere is the larval stage of _____.
- (f) Intermediate host of Fasciola hepatica is _____.
- (g) Infective larval stage of Ascaris lumbricoides is _____.
- (h) The parasite that cause elephantiasis in human is _____.

(Continued)

(3)

PART - II

2. Answer any *eight* questions within *two to three* sentences each : $1\frac{1}{2} \times 8$
- (a) Nutrition in Euglena.
- (b) Microscleres
- (c) Pathogenecity of Entamoeba histolytica
- (d) Medusa
- (e) Atoll
- (f) Miracidium larva
- (g) Strobila
- (h) Prophylaxis for filariasis
- (i) Pathogenecity of Ascaris lumbricoides
- (j) Evolutionary significance of Ctenophora.

I-CC-Zoo-I

(Turn Over)

(4)

PART – III

3. Answer any *eight* questions within 75 words each :

2 × 8

- (a) Structure of amoeba
- (b) Gamogony in Plasmodium
- (c) Reproduction in Euglena
- (d) Economic importance of Corals
- (e) Metagenesis in Obelia
- (f) Cercaria larva
- (g) Class-Cestoda
- (h) Physiological adaptations of Helminthes
- (i) Microfilaria of Wuchereria bancrofti

(5)

PART – IV

4. Answer *all* the questions within 500 words each :

6 × 4

- (a) Describe life cycle of Plasmodium vivax in mosquito body.

Or

Write an account on canal system in Sponges.

- (b) Write an essay on polymorphism in Cnidaria.

Or

State general characteristics of Cnidaria. Add a note on its classification upto class.

(6)

(c) Briefly describe life cycle of *Fasciola hepatica*.

Or

Describe pathogenecity of *Taenia solium*, its diagnosis, treatment & prophylaxis measures.

(d) State general characteristics of phylum-Nemathelminthes. Add a note on its classification upto class.

Or

Describe life cycle of *Wuchereria bancrofti* briefly.

2023

ZOOLOGY

(Principles of Ecology)

[Honours]

Paper — CC-ZOO-II

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

Draw diagrams wherever necessary

PART — I

1. Fill in the blanks :

1 × 8

(a) _____ food chain always starts with a producer.

(Turn Over)

(2)

- (b) Ecological pyramid which is always upright is _____.
- (c) Movement of individuals away from the original population to a new location is called _____.
- (d) Mutual interaction between individuals of different species where both are benefited is called _____.
- (e) Initial population which initiate colonization in a new habitat is called _____.
- (f) Change in community structures that occur at the boundary of two habitats is called _____.
- (g) The most common statistical tool that is used for hypothesis testing is _____.
- (h) The data which is obtained through experimentation by self is called _____.

(3)

PART - II

2. Answer any *eight* questions within *two to three* sentences each : $1\frac{1}{2} \times 8$

- (a) Food web
- (b) Y-shaped food chain
- (c) Synecology
- (d) Parasitism
- (e) Population density
- (f) Sex ratio
- (g) Climax community
- (h) Species diversity
- (i) Biological data

(4)

- (j) Range as a measure of dispersion.

PART - III

3. Answer any *eight* questions within 75 words each : 2 × 8

- (a) Biotic components of an ecosystem
- (b) Law of limiting factors
- (c) Detritus food chain
- (d) Intraspecific population interaction
- (e) Fecundity tables
- (f) Natality and Mortality
- (g) Species dominance
- (h) Community

(5)

- (i) Sampling techniques

- (j) Mode.

PART - IV

4. Answer *all* questions within 500 words each : 6 × 4

- (a) What is ecological pyramid ? Describe different types of ecological pyramid with examples & their significance.

Or

Describe light as an ecological factor.

- (b) Describe Gause's principle with laboratory and field examples.

Or

Describe various attributes of population briefly.

- (c) Describe ecological succession taking newly excavated pond as an example.

Or

Describe vertical stratification of a community and its significance.

- (d) Describe frequency polygon & histogram with diagrams & example.

Or

Calculate standard deviation of the following frequency distribution.

Class Interval	0 - 2	2 - 4	4 - 6	6 - 8	8 - 10	10 - 12	12 - 14	14 - 16
Frequency	4	8	10	18	10	4	2	1

2022

ZOOLOGY

(Non-chordata-I : Protista to Pseudocoelomates)

Paper — CC-ZOO-I

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

Draw diagrams wherever necessary

PART — I

1. Fill in the blanks : 1 × 8

(a) A sexual life cycle of *Plasmodium vivax* occurs in the body of _____.

(b) Spicules are secreted by specialised mesenchyme cells known as _____.

(Turn Over)

(2)

- (c) The polyps which produce sexual medusa are called _____.
- (d) A ring like circular coral reef that encloses a central lagoon is called _____.
- (e) The shedding of gravid segments from posterior end of tapeworm is called _____.
- (f) The free swimming larva of *Fasciola hepatica* is called _____.
- (g) The infective stage of *wuchereria bancrofti* for human is _____.
- (h) The definitive host of *Ascaris lumbricoides* is _____.

PART – II

2. Answer any *eight* questions within *two to three* sentences each : $1\frac{1}{2} \times 8$
- (a) Role of Contractile Vacuole in *Amoeba*.
 - (b) Symptoms of Malaria.

(3)

- (c) Megasccleres.
- (d) Significance of polymorphism in Cnidaria.
- (e) Fringing reef.
- (f) Economic importance of corals.
- (g) Redia larva.
- (h) Symptoms of Taeniasis
- (i) Prophylaxis for Ascariasis
- (j) Pathogenecity of *Wuchereria bancrofti*.

PART – III

3. Answer any *eight* questions within 75 words each : 2×8
- (a) Nutrition in *Euglena*.
 - (b) Ascoroid type canal system.
 - (c) Sexual reproduction in Protists.

(4)

- (d) General characters of Cnidaria.
- (e) Difference between Polyp & Medusa.
- (f) Characters of class-Cestoda.
- (g) Proglotids in Taenia solium.
- (h) Sexual dimorphism in Ascaris.
- (i) General characters of Nematodes.
- (j) Corals.

PART - IV

4. Answer all the questions within 500 words each : 6×4

- (a) Describe life cycle and pathogenicity of Entamoeba histolytica.

Or

Write an essay on locomotion in Protista.

- (b) Describe metagenesis in Obelia.

(5)

Or

Give an account on Coral reefs and their importance.

- (c) Describe life cycle of Taenia solium briefly.

Or

State general characters of phylum-Platyhelminthes. Add a note on its classification upto class.

- (d) Give an account on parasitic adaptations in Helminthes.

Or

Describe life cycle of Ascaris lumbricoides.

Total Number of Pages—5

I-CC—Zoo-II

2022

ZOOLOGY

(Principles of Ecology)

[Honours]

Paper — CC-ZOO-II

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

Draw diagrams wherever necessary

PART — I

1. Fill in the blanks :

1 × 8

(a) Detritus food chain always starts with _____.

(b) Network of food chains in an ecosystem is called _____.

(Turn Over)

(2)

- (c) Number of individuals of a species in an unit area is called _____.
- (d) A group of individuals of the same species within a community is called _____.
- (e) An ecological community in which different populations of species coexist in balance with each other is called a _____.
- (f) The process of formation of a stable community is called _____.
- (g) The value that appears most often in a set of data values is called _____.
- (h) The difference between the maximum and minimum values of a set of data is called _____.

PART – II

2. Answer any *eight* questions within *two to three* sentence each :

$1\frac{1}{2} \times 8$

- (a) Trophic level

(3)

- (b) Grazing food chain
- (c) In-situ conservation
- (d) Symbiosis
- (e) Age ratio
- (f) Exponential growth
- (g) Species abundance
- (h) Pioneer species
- (i) Frequency polygon
- (j) Chi-square test.

PART – III

3. Answer any *eight* questions within 75 words each :

2×8

- (a) Energy flow in an ecosystem
- (b) Wildlife conservation
- (c) Ecological pyramid

(4)

- (d) Nitrogen cycle
- (e) Survivorship curve
- (f) Life table
- (g) Vertical stratification
- (h) Ecotone and edge effect
- (i) Histogram
- (j) Biological data.

PART — IV

4. Answer *all* the questions within 500 words each : 6×4

- (a) Describe various structural and functional components of a pond ecosystem.

Or

Describe temperature as an ecological factor.

- (b) Explain interspecific population interactions with examples.

(5)

Or

Describe density dependent population regulation with examples.

- (c) Describe various theories pertaining to climax community.

Or

Describe various characteristics of a community.

- (d) Describe various sampling techniques used for collection of data.

Or

Describe various measures of central tendency stating their advantages, disadvantages and applications.

2023

ZOOLOGY

Paper — CC-ZOOL-III

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

Draw diagram wherever necessary

PART — I

1. Fill in the blanks :

1 × 8

(a) Type of Coelom in Annelids is _____.

(b) Nephridia in annelids opens into the Coelom by a ciliated funnel called _____.

(Turn Over)

(2)

- (c) Periodic shedding of exoskeleton in arthropods occurs by a process called _____.
- (d) Tracheal gills are characteristic of _____ insects.
- (e) Long respiratory siphons that are used for terrestrial respiration in Molluscs are called _____.
- (f) Torsion is characteristic of _____.
- (g) Triploblastic, Coelomate and radial symmetry animals are found in phylum _____.
- (h) The common ancestral larva of Echinoderms and Chordates is _____.

PART - II

2. Answer any *eight* questions within *two to three* sentences each : $1\frac{1}{2} \times 8$
- (a) Nephromixia
- (b) Archiannelida

(Continued)

(3)

- (c) Types of coelom
- (d) Crustacea
- (e) Mosaic vision
- (f) Hormonal control of metamorphosis in insects
- (g) Ctenidia
- (h) Bivalvia
- (i) Components of water vascular system
- (j) Significance of Echinoderm larva.

PART - III

3. Answer any *eight* questions within 75 words each : 2×8
- (a) Significance of metamerism
- (b) Protonephridia

II-CC-Zool-III

(Turn Over)

(4)

- (c) Class-Insecta
- (d) Ommatidia
- (e) Characteristics of social insects
- (f) Non-reproductive caste in termites
- (g) Terrestrial respiration in Molluscs
- (h) Class-Monoplacophora
- (i) Class-Asteroidea
- (j) Tube feet in Echinoderms.

PART - IV

4. Answer *all* the questions within 500 words each : 6×4

- (a) Describe Metamerism in Annelids briefly.

Or

Give a brief classification of phylum Annelida. Add a note on general characters of Annelida.

(5)

- (b) Give an account on social life in bees.

Or

Describe metamorphosis in insects.

- (c) Give an account on torsion & detorsion in Gastropods.

Or

State general characters of Phylum Mollusca. Briefly describe classification of Mollusca upto class.

- (d) Describe affinities of Echinoderm larva with chordates.

Or

State general characters of phylum Echinodermata. Briefly describe classification of Echinodermata upto class.

2023

ZOOLOGY

Paper — CC-ZOOL-IV

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

Draw diagram wherever necessary

PART — I

1. Fill in the blanks : 1 × 8

(a) Non-cellular microscopic infectious agents
that can replicate inside a host cells are

(Turn Over)

(2)

(b) The major intercellular adhesive junctions at basolateral membrane of cells are called _____.

(c) Smooth endoplasmic reticulum helps in synthesis of _____.

(d) During energy crisis, lysosomes digest the cell in which they are present. Hence they are called _____.

(e) Enzyme associated with elementary particles of mitochondria that helps in ATP synthesis is _____.

(f) Chemi-osmotic hypothesis was proposed by _____.

(g) The most common second messenger in animal cell is _____.

(h) Structural unit of an eukaryotic chromosome consisting of a stretch of DNA coiled around a core of histones are called _____.

(Continued)

(3)

PART - II

2. Answer any *eight* questions within *two to three* sentences each : $1\frac{1}{2} \times 8$

(a) Mycoplasma

(b) Active transport

(c) Tight junction

(d) Intermediate filaments

(e) Rough Endoplasmic reticulum

(f) Golgi vesicles

(g) Ubiquinone

(h) Mitochondrial matrix

(i) Heterochromatin

(j) GPCR.

II-CC-Zool-IV

(Turn Over)

(4)

PART - III

3. Answer any *eight* questions within 75 words each :

2 × 8

- (a) Prions
- (b) Facilitated transport
- (c) Unit membrane model of plasma membrane
- (d) Cytoskeleton
- (e) Microfilaments
- (f) Semi-autonomous nature of mitochondria
- (g) Cytochromes
- (h) Elementary particles of mitochondria
- (i) Nucléolus
- (j) Cell cycle.

(5)

PART - IV

4. Answer *all* the questions within 500 words each : 6 × 4

- (a) Describe the structure of a typical Eukaryotic cell with diagram.

Or

Describe various cell junctions and their functions.

- (b) Describe briefly about structure and function of different cytoskeletal structures.

Or

Give a detailed account of lysosomes and its function.

- (c) Give a detailed structure and function of Peroxisomes.

Or

Explain the mechanism of functioning of mitochondrial respiratory chain.

(d) Describe briefly about chromatin and its packaging within nucleus.

Or

Give an account of Meiotic Cell Cycle with diagram.

Total Number of Pages—10

II-GE-2/1—Zoo-I(A/B)

2023

ZOOLOGY

Paper — GE-2/1-ZOO-I(A/B)

Full Marks : 60

Time : 3 hours

Answer from any one Set as per your specialization

The figures in the right-hand margin indicate marks

Draw diagrams wherever necessary

SET — A

(*Animal Diversity*)

PART — I

1. Fill in the blanks :

1 × 8

(a) Contractile vacuole in Protozoans helps in
_____.

(Turn Over)

(2)

- (b) Primary host for Plasmodium is _____.
- (c) Any worker bee of a bee hive when fed with royal jelly, they develop into _____.
- (d) Water vascular system is a distinct feature of phylum _____.
- (e) In Urochordates, notochord is restricted to _____ region of body.
- (f) Movement of fishes between their feeding ground and breeding ground is called _____.
- (g) Dentition in which base of the teeth is enclosed in a deep socket in jaw bones is called _____.
- (h) The connecting link between birds and reptiles was _____.

PART – II

2. Answer any *eight* questions within *two to three* sentences each : $1\frac{1}{2} \times 8$
- (a) Holozoic nutrition in protozoa.

II-GE-2/1-Zoo-I(A/B)

(Continued)

(3)

- (b) Significance of canal system in Porifera
- (c) Medusa in Cnidaria
- (d) Queen bee
- (e) Importance of torsion in Gastropods
- (f) Radial symmetry in Echinoderms
- (g) Factors regulating fish migration
- (h) Retrogressive metamorphosis
- (i) Flight muscles in birds
- (j) Amniotes.

PART – III

3. Answer any *eight* questions within 75 words each : 2×8
- (a) Polyp in Cnidaria
- (b) General characters of Protozoa

II-GE-2/1-Zoo-I(A/B)

(Turn Over)

(4)

- (c) Ookinete stage of Plasmodium.
- (d) General characters of Annelida
- (e) Division of labour in a bee hive
- (f) Torsion in gastropods
- (g) Osmoregulation
- (h) General Characters of Amphibia
- (i) Origin of birds
- (j) Common Characters of Primates.

PART – IV

4. Answer all the questions within 500 words each : 6×4

- (a) Give an account on canal system in Porifera.

Or

Describe life cycle of *Taenia solium* briefly.

(5)

- (b) What is metamerism ? Describe briefly about metamerism in Annelids.

Or

Give an account on Pearl formation. Add a note on its composition.

- (c) State salient features of different groups of Protochordates.

Or

Describe various adaptations of Amphibia for terrestrial life.

- (d) Give an account on dentition in mammals.

Or

Describe briefly about Terrestrial adaptations in reptiles.

(6)

SET - B

(*Insect Vectors and Diseases*)

PART - I

1. Fill in the blanks :

1 × 8

- (a) Organisms which harbour pathogens within their body indefinitely without getting infected are called _____.
- (b) Pathogenic organism that cause Malaria is _____.
- (c) Causative agent of Phthiriasis is _____.
- (d) Blood sucking bugs causes _____.
- (e) The basic form of antennae in insects is _____.
- (f) Biting of _____ mosquito causes filaria.
- (g) Causative agent of Typhus fever is _____.
- (h) Bed bugs belongs to _____ order.

II-GE-2/1-Zoo-I(A/B)

(Continued)

(7)

PART - II

2. Answer any *eight* questions within *two to three* sentences each : $1\frac{1}{2} \times 8$

- (a) Biological insect vector
- (b) Compound eye in insects
- (c) Mandibulate type of mouth part
- (d) Symptoms of Malaria
- (e) Control of sand fly vector
- (f) Viral encephalites
- (g) Control of bed bug infestation
- (h) Prevention of chagas disease
- (i) Control of fleas
- (j) Relapsing fever.

II-GE-2/1-Zoo-I(A/B)

(Turn Over)

(8)

PART - III

3. Answer any *eight* questions within 75 words each : 2×8

- (a) Types of antennae
- (b) Vectorial capacity
- (c) Hemiptera
- (d) Dengue
- (e) Control of house fly
- (f) Phlebotomus fever
- (g) Body louse
- (h) Vagabond disease
- (i) Chagas disease
- (j) Bed bugs as mechanical vectors.

(9)

PART - IV

4. Answer *all* questions within 500 words each : 6×4

- (a) Give a brief account of general features of insects

Or

Describe various adaptations as vectors.

- (b) Give a brief account of Chikungunya and its control measures.

Or

Give a brief account of Myiosis and its control measures.

- (c) Describe human louse as an important insect vector.

Or

Briefly describe about Trench fever and its control measures.

(d) Briefly describe about chagas disease and its preventive measures.

Or

Describe bugs as insect vector with examples.

2023
ZOOLOGY
(Honours)

Paper- CC-V

Full Marks : 60

Time : 3 hours

Answer from **all** the Parts as directed.

*The figures in the right-hand margin
indicate marks.*

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

PART—I

1. Fill in the blanks:

1 × 8

(a) Among Protochordates, notochord is
confined to the larval tail only in

_____.

(Turn Over)

(2)

- (b) In Urochordates, body is covered by a protective covering called _____.
- (c) First jawless primitive fish-like vertebrates are _____.
- (d) Migration of fishes from seawater to freshwater is called _____.
- (e) The order of reptiles having completely divided four-chambered heart is _____.
- (f) Sound producing organ present at the junction of trachea and bronchi in birds is called _____.
- (g) Advanced viviparous placental mammals without marsupium are included under infraclass _____.
- (h) All continents are parts of a single great landmass at the beginning of earth called _____.

(3)

PART—II

2. Answer any *eight* questions within 2-3 sentences each: 1.5 × 8

- (a) Cephalochordates.
- (b) Tetrapoda.
- (c) Causes for migration of fishes.
- (d) Advantages of accessory respiratory organ for fishes.
- (e) Primitive characters of Dipnoi.
- (f) Snake venome.
- (g) Purpose of migration in birds.
- (h) Flight muscles in birds.
- (i) Prototheria.
- (j) Wallace's line.

(4)

PART—III

3. Answer any *eight* questions within 75 words each: 2 × 8

- (a) Hemichordata.
- (b) Significance of Ascidian Tadpole larva.
- (c) Advanced characters of chordates.
- (d) Factors influencing migration in fishes.
- (e) Order-Anura.
- (f) Poison glands in reptiles.
- (g) Reptilian characters of Archaeopteryx.
- (h) Types of migration in birds.
- (i) Infraclass-Metatheria
- (j) Oriental Realm.

(5)

PART—IV

Answer *all* questions within 500 words each.

4. Describe retrogressive metamorphosis in Urochordates. 6 × 4

Or

Describe Echinoderm theory of Origin of chordates.

5. Write an essay on parental care in fishes with examples.

Or

Give an account on origin of tetrapoda.

6. State general characters and classification of reptiles upto order.

Or

Write an account on migration of birds.

(6)

7. Give an account on affinities of Prototheria.

Or

State various theories pertaining to distribution of animals.

Total Pages : 6

III-CC-ZOO-VI

2023

ZOOLOGY

(Honours)

Paper- CC-VI

Full Marks : 60

Time : 3 hours

Answer from all the Parts as directed.

*The figures in the right-hand margin
indicate marks.*

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

Draw diagram wherever necessary.

PART—I

1. Fill in the blanks:

1 × 8

(a) When epithelial cells occurs in multiple layers, then it is called _____.

(Turn Over)

(2)

- (b) Bones without inorganic matter are called _____.
- (c) All the muscle fibres innervated by a single motor nerve terminals forms a _____.
- (d) Resting membrane potential of a neuron is _____.
- (e) Corpus Luteum secretes _____ hormone.
- (f) Structure that get implanted into uterus to develop into foetus is called _____.
- (g) Melatonin is secreted by _____ gland.
- (h) Diabetes insipidus is caused due to deficiency of _____ hormone.

((13))

III PART—II

2. Answer any *eight* questions within 2-3 sentences each: 1.5 × 8

- (a) Adipose tissue.
- (b) Haversian System.
- (c) Nissel granules.
- (d) Smooth muscles.
- (e) Myogen fraction.
- (f) Ear ossicles.
- (g) Lactation.
- (h) Epididymis.
- (i) Calcitonin.
- (j) Islets of Langerhans.

(4)

PART-III

3. Answer any *eight* questions within 75 words each: 2×8

- (a) Areolar tissue
- (b) Simple epithelium
- (c) Sarcomere
- (d) Reflex arc
- (e) Photoreceptors
- (f) Semen
- (g) Puberty
- (h) HCG
- (i) Steroid hormones
- (j) cAMP mechanism of hormone action

(5)

PART-IV

4. Answer *all* questions within 500 words each: 6×4

- (a) Describe the structure of neuron with neat labelled diagram.

Or

Give an account of Cartilages stating structure, types and function.

- (b) What is Synapse ? Explain mechanism of Synaptic transmission.

Or

Explain molecular and chemical basis of muscle contraction.

- (c) Describe histology of testis with diagram.

Or

(6)

Describe Ovarian cycle in human female.

- (d) Discuss about anterior pituitary stating its structure, hormones and their functions.

Or

State classification of hormones.
Describe mechanism of action of steroid hormones.

2023

ZOOLOGY

(Honours)

Paper- CC-VII

Full Marks : 60

Time : 3 hours

Answer from all the Parts as directed.

*The figures in the right-hand margin
indicate marks.*

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

Draw diagram wherever necessary.

PART—I

1. Fill in the blanks:

1 × 8

(a) All sugars having 6 membered ring
structure are called _____.

(Turn Over)

(2)

- (b) Esters of fatty acids with glycerol are called _____.
- (c) The amino acids that produce ketone bodies during their metabolism are called _____.
- (d) The antigen binding sites of immunoglobulins are called _____.
- (e) Lock and theory of enzyme action was proposed by _____.
- (f) Enzymes that possess extra sites besides the active site for substrate binding are called _____.
- (g) Rod shaped bacteria are called _____.
- (h) Genetic material of HIV is _____.

PART—II

2. Answer any *eight* questions within 2-3 sentences each: 1.5×8

III-CC-ZOO-VII

(Continued)

((3))

- (a) Sucrose.
- (b) Steroids.
- (c) Glycogen.
- (d) Simple proteins.
- (e) α -amino acids.
- (f) IgM.
- (g) Isoenzymes.
- (h) Activation energy.
- (i) Virioids.
- (j) Window period of HIV infection.

PART—III

3. Answer any *eight* questions within 75 words each: 2×8

- (a) Unsaturated fatty acids

III-CC-ZOO-VII

(Turn Over)

(14)

- (b) Quaternary structure of proteins.
- (c) Denaturation of proteins.
- (d) Triacyl glycerols.
- (e) Cellulose.
- (f) Essential amino acids.
- (g) Cofactors.
- (h) Allosteric enzymes.
- (i) Typhoid.
- (j) Bacteriophage.

PART—IV

4. Answer *all* the questions within 500 words each: 6×4

- (a) Describe structure and biological importance of monosaccharides.

(15)

Or

Discuss structure and significance of Phospholipids and Glycolipids.

- (b) Give an account of conjugate proteins and their importance.

Or

Describe structure and properties of α -amino acids.

- (c) Give an account on nomenclature and classification of enzymes with examples.

Or

Briefly describe about regulation of enzyme action.

- (d) Describe reproduction in virus briefly.

Or

(6)

Describe application of microbes in food industry.

Total Pages : 7

I-CC-Zoo-I

2021

ZOOLOGY

(Honours)

Paper-CC-Zoo-I

[*Non-Chordates-I : Protista to
Pseudocoelomates*]

Full Marks : 60

Time : 3 hours

Answer all questions.

*The figures in the right-hand margin
indicate marks.*

PART—I

1. Fill in the blanks :

1 × 8

(a) In Sponge, the water exit by ———.

(Turn Over)

(2)

- (b) The mode of nutrition in Amoeba is known as ——— Nutrition.
- (c) Mouth part of Medusa is known as ———.
- (d) ——— is the larva of Ctenophora.
- (e) Secondary host of Taenia solium is ———.
- (f) Viviparity is seen in ——— nematode.
- (g) The diseased condition caused by Wuchereria is called ———.
- (h) The cause of 'Liver rot' in sheep is ———.

(3)

PART—II

2. Answer any *eight* of the following in two or three sentences : 1.5 × 8

- (a) What is mode of nutrition in Euglena ?
- (b) What is the product of exoerythrocytic schizogony ?
- (c) What is Schieffner's granules ?
- (d) What is spicules ?
- (e) Define Haxacanth.
- (f) Define Apolysis.
- (g) Which is the connecting link between plant and animal ?

(4)

- (h) Which is the infective stage of *Ascaris* for man ?
- (i) What is metagenesis ? Describe.
- (j) What is Elephantiasis ?

PART—III

3. Answer any *eight* of the following within 75 words : 2×8

- (a) Define Ookinete stage of *Plasmodium*.
- (b) Explain the thermotaxis movement of *Amoeba*.
- (c) What are the different modes of locomotion in protista ?

(5)

- (d) Write parasitic adaptation of *Fasciola*.
- (e) Write characters of sexual dimorphism in *Ascaris lumbricoides*.
- (f) Write different types of Malaria and its causative organism.
- (g) Describe the different types of coral reef formation.
- (h) Write four distinct characters of phylum Nematohelminthes.
- (i) Write the microfilaria larval adaptation.
- (j) Define Microfilariae.

(6)

PART—IV

4. Answer any *four* of the following within 500 words each : 6 × 4

- (a) Describe polymorphism in Cnidaria.
- (b) Elaborate on life cycle and pathogenicity of *Plasmodium vivax*.
- (c) Describe various canal system in Phylum Porifera.
- (d) Describe life cycle of *fasciola hepatica*.
- (e) Write general characteristics of phylum Cnidaria and its classification up to class.

(7)

- (f) Discuss the evolutionary significance of ctenophore.
- (g) Describe the life cycle of *Wuchereria bancrofti*.
- (h) Describe life cycle of *Taenia solium*.
- (i) Discuss the parasitic adaptations in *Ascaris lumbricoides*.

2021

ZOOLOGY

(Honours)

Paper-CC-Zoo-II

(*Principles of Ecology*)

Full Marks : 60

Time : 3 hours

Answer all questions.

*The figures in the right-hand margin
indicate marks.*

PART—I

1. Fill in the blanks :

1 × 8

- (a) The carrying capacity of a population is chiefly controlled by ———.

(Turn Over)

(2)

- (b) The study of interaction between individuals and its environment in known as ———.
- (c) Arrangement of species into different vertical layers is termed ———.
- (d) The true microdecomposer considered are ——— and ———.
- (e) The total of all observations divided by number of observations is called ———.
- (f) The transition area between two biomes is known as ———.
- (g) Any hypothesis which is tested for the purpose of rejection under the assumption that it is true is called ———.

(3)

- (h) The term ecosystem was introduced by ———.

PART—II

2. Answer any *eight* questions within two to three sentences : 1.5 × 8

- (a) What do you mean by Synecology ?
- (b) Define Gause principle.
- (c) Define Simpson's diversity index.
- (d) Define central tendency.
- (e) What is parasitoidism ?
- (f) Give the principal components of biogeochemical cycles.

(4)

(g) What are class intervals ? Narrate.

(h) Define stratified sampling.

(i) What is keytone species ?

(j) What is biological data ?

PART—III

3. Answer any *eight* questions within 75 words each : 2×8

(a) Differentiate between primary productivity and Secondary productivity of ecosystem.

(b) Differentiate between crude density and specific density.

(5)

(c) Draw the diagram of different types of age pyramid.

(d) Differentiate between Food chain and Food web.

(e) What is biological disporsal of organism ? How it varies from dispersion ?

(f) What is nudation and write its different causes.

(g) Give diagram of Nitrogen cycle.

(h) Explain population interaction.

(i) What is measure of central tendency ? Discuss.

(j) Find the geometric mean of 2, 4 and 8.

(6)

PART—IV

4. Answer any *four* questions within 500 words each :

6 × 4

- (a) Explain Light as Physical factor.
- (b) What are law of limiting factors ? Discuss.
- (c) Describe exponential and Logistic theory of population growth.
- (d) Write Gause's principle of exclusion criteria with suitable examples.
- (e) Discuss the zonation and vertical stratification of a community.

(7)

- (f) Find the mean deviation about the median for the following data :
3, 9, 5, 3, 12, 10, 18, 4, 7, 19, 21
- (g) Describe different types of inter and intraspecific competition among population.
- (h) Describe ecological succession with one example.

Total Pages : 10

I-GE-1/2-Zoo-I

2021

ZOOLOGY

Paper-GE-A-Zoo-I

[*Animal Diversity/Insect Vectors
and Diseases*]

Full Marks : 60

Time : 3 hours

*The figures in the right-hand margin
indicate marks.*

SECTION-A

Answer all questions.

Part—I

1. Fill in the blanks :

1 × 8

(a) Larval form of coelentrata is called

_____.

(Turn Over)

(2)

- (b) Locomotory organs of Annelid is —.
- (c) Shedding of preglottid in tapeworm is called —.
- (d) The incubation period of Plasmodium vivax is — hours.
- (e) — protochordate shows retrogressive Metamorphosis.
- (f) Archosauria were 'ruling reptiles' of — era.
- (g) In mammal, — teeth is called wisdom teeth.
- (h) The stem reptiles are belongs to the order —.

Part—II

2. Answer any *eight* questions within two to three sentences each : 1.5 × 8

I-GE-1/2-Zoo-I

(Continued)

(3)

- (a) What is cnidoblast ?
- (b) Define exflagellation.
- (c) Define Strobilation.
- (d) Comment on polyphyletic origin of mammals.
- (e) What is amniotes.
- (f) Differentiate between neoteny and paedogenesis.
- (g) What is parazoology ?
- (h) What is Onchosphere ?
- (i) What is metamerism ?
- (j) Write about of succession of teeth.

Part—III

3. Answer any *eight* questions within 75 words : 2 × 8

I-GE-1/2-Zoo-I

(Turn Over)

(4)

- (a) Write general characters of insect.
- (b) Write general characters of Protochordates.
- (c) Write notes on metamerism in Annelida.
- (d) Write different types of malaria and its causative organism.
- (e) Write about diphyletic origin of birds.
- (f) Differentiate between Polyp and Medusa.
- (g) What is Osmoregulation ?
- (h) Differentiate between Cartilaginous and bony fishes.
- (i) How Seymouria is intermediate between amphibians and Reptiles ?
- (j) Write typical characters of Primates.

(5)

Part—IV

4. Answer any *four* questions within 500 words : 6 × 4

- (a) Explain the life cycle of Malarial parasite occurs in primary and secondary host.
- (b) What is torsion ? Write the mechanism of torsion in Gastropods.
- (c) Describe canal system in Porifera.
- (d) Give an account of parental care in Amphibia.
- (e) Describe torsion in Gastropoda.
- (f) Discuss flight adaptations in birds.
- (g) Describe the statement 'birds are glorified from reptiles'.

(6)

- (h) What are Anandromous and Catadromous fishes ? How these fishes regulate the body fluid in both fresh water and marine water habitat ?

SECTION-B

Answer all questions.

Part-I

1. Fill in the blanks :

1 × 8

- (a) _____ hormones cause moulting in insect.
- (b) The function of epicuticle in insect is _____.
- (c) In honey bees, a flight for mating purposes is called _____.
- (d) Peritrophic membrane is absent in _____ order.
- (e) The last segment of insect which bears a structure that help in during mating is _____.

I-GE-1/2-Zoo-I

(Continued)

(7)

- (f) Chikungunya is a _____ type of disease.
- (g) _____ is the causative organism of Plague.
- (h) _____ endoparasites of humans shows viviparity.

Part-II

2. Answer any *eight* questions within two to three sentences each : 1.5 × 8

- (a) Write types of antennae in insects.
- (b) Define compound eyes of insect.
- (c) What is dengue ?
- (d) What is vectorial capacity ?
- (e) Write about relapsing fever.
- (f) Write about Typhus fever.

I-GE-1/2-Zoo-I

(Turn Over)

(8)

- (g) Define reservoir.
- (h) Define Chikungunia.
- (i) What is Leishmaniasis ?
- (j) What is Chaga's disease ?

Part—III

3. Answer any *eight* questions within 75 words : 2×8

- (a) Write about sand fly.
- (b) Write about Host-Vector relationship.
- (c) What is viral encephalitis ?
- (d) What are the adaptations of vectors ?
- (e) Define malaria and its causative organism.
- (f) Write about phlebotomous fever.

(9)

- (g) What is Filariasis ?
- (h) Write a note of Plague.
- (i) What is Vagabond's disease ?
- (j) Define Pthiriasis.

Part—IV

4. Answer any *four* questions within 500 words : 6×4

- (a) Discuss mouth parts of insects with reference to its feeding habit.
- (b) Give a detailed account of different types of mouth parts present in insect.
- (c) Classify the insects up to orders by giving suitable insect examples.
- (d) Explain two dipteran vectors' life cycle which are responsible for spreading of kalazer and Dengue diseases.

- (e) Discuss housefly as an important mechanical vectors.
 - (f) Explain any two louse-borne diseases of human and add a note on control of the human louse.
 - (g) Why are bed bugs regarded as mechanical vectors ? Write the preventive measures against these bugs.
 - (h) Describe Fleas as an important vectors.
-

2022

ZOOLOGY

(*Non-Chordates-II : Coelomates*)

Paper — III

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

Draw diagrams wherever necessary

PART — I

1. Fill in the blanks :

1 × 8

(a) A true coelom is always lined by _____
germ layer of embryo.

(b) The excretory structure formed by union of
nephridia and coelomoduct in annelids is
called _____.

(2)

- (c) Compound eye of crustaceans consists of a member of independent visual units called _____.
- (d) The diploid fertile female in a beehive is _____.
- (e) The primary respiratory structure in Molluscs is a comblike structure called _____.
- (f) Trochophore larva metamorphoses to form an advanced larva called _____.
- (g) Internal canals of water vascular system in Asteroidea communicate with external sea water through _____.
- (h) Spiny skin animals are included under phylum _____.

PART - II

2. Answer any *eight* questions within *two to three* sentences each : $1\frac{1}{2} \times 8$

(3)

- (a) State characteristics of Coelom.
- (b) Define metamerism.
- (c) State functions of nephridia.
- (d) What is ecdysis ? State its significance.
- (e) Name the respiratory structures associated with aerial respiration in Arthropods.
- (f) State functions of workers in a beehive.
- (g) Why Onychophora is called a living fossil ?
- (h) State significance of torsion.
- (i) What is the function of tubefeet ?
- (j) Name the larval forms of Echinodermata.

PART - III

3. Answer any *eight* questions within 75 words each : 2×8

(4)

- (a) Describe different types of metamerism in annelids with examples.
- (b) State general characteristics of phylum Annelida.
- (c) Describe compound eye in Arthropods.
- (d) State general characters of class crustacea with examples.
- (e) What are the different types of metamorphosis seen in insects with examples ?
- (f) State general characters of phylum Mollusca.
- (g) Describe torsion in gastropods.
- (h) Describe social life of termites.
- (i) Briefly explain affinities of Echinoderms with chordates.
- (j) Give a brief classification of phylum-Echinodermata.

(Continued)

(5)

PART – IV

4. Answer *all* the questions within 500 words each : 6×4
- (a) Give an account on evolution of Coelom.

Or

Explain excretion in Annelids briefly.

- (b) Describe respiration in Arthropods briefly with examples.

Or

State general characters of Onychophora and explain its evolutionary significance.

- (c) Give an account on respiration in Mollusca.

Or

Explain structure and evolutionary significance of Trochophore larva.

(6)

(d) Describe water-vascular system in Asteroidea.

Or

Describe larval forms of phylum Echinodermata.

2022

ZOOLOGY

(Cell Biology)

Paper—IV

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

Draw diagrams wherever necessary

PART — I

1. Fill in the blanks : 1 × 8

(a) Infectious agents that consists of only naked RNA without any protective layer are called _____.

(b) Transportation across membranes based on concentration gradient is called _____.

(Turn Over)

(2)

- (c) Enzymes present inside lysosomes are collectively called _____.
- (d) The cytoskeletal structure that helps in mitotic cell division are _____.
- (e) Space enclosed by inner mitochondrial membrane is called _____.
- (f) Mitochondrial respiratory chain is associated with _____ of mitochondria.
- (g) The type of RNA synthesised at nucleolus is _____.
- (h) In somatic organs of an organism, _____ cell division occurs.

PART – II

2. Answer any *eight* questions within *two to three* sentences each : $1\frac{1}{2} \times 8$

- (a) What are desmosomes ?
- (b) Define facilitated transport.

(3)

- (c) What are prions ?
- (d) State functions of microfilaments.
- (e) What is the role of smooth Endoplasmic reticulum in a cell ?
- (f) Why lysosomes are called suicidal bags of the cell ?
- (g) Name the components of mitochondrial respiratory chain.
- (h) What do you mean by semi-autonomous nature of mitochondria ?
- (i) Define cell-cycle ?
- (j) Why cAMP is considered as second messenger ?

PART – III

3. Answer any *eight* questions within 75 words each : 2×8

(4)

- (a) Differentiate between prokaryotic and eukaryotic cells.
- (b) Describe briefly about Gap junctions.
- (c) Briefly describe about virus.
- (d) Explain structure and function of microtubules.
- (e) Describe structure and function of lysosomes.
- (f) Why peroxisomes are important for a cell ?
- (g) Explain endosymbiotic hypothesis.
- (h) Describe nuclear pore complex.
- (i) Differentiate between Heterochromatin and Euchromatin.
- (j) Write briefly about GPCR.

PART - IV

4. Answer all the questions within 500 words each :

6 × 4

II-CC-Zoo-IV

(Continued)

(5)

- (a) Describe the structure of a prokaryotic cell with diagram.

Or

Describe various models of plasma membrane structure.

- (b) Describe structure and function of Endoplasmic reticulum.

Or

Describe structure and function of Golgi Complex.

- (c) Describe a detailed structure of mitochondria with diagram.

Or

Describe briefly about mitochondrial respiratory chain.

II-CC-Zoo-IV

(Turn Over.)

(6)

(d) Describe structure of nucleus and state its functions.

Or

Give an account on mitotic cell cycle with diagram.

2022

ZOOLOGY

Paper-CC-V

Full Marks : 60

Time : 3 hours

Answer all questions.

*The figures in the right-hand margin
indicate marks.*

1. Fill in the blanks : 1 × 8

(a) Larva of Hemichordata is called _____.

(b) Metamorphosis in which there are degeneration of characters from larvae to adult is called _____.

(c) In phylum chordata, true chordates are included under the group _____.

(Turn Over)

(2)

- (d) Fishes in which gills are covered by an operculum are included in the class —.
- (e) Poison glands in snakes are modified —.
- (f) — is a connecting link between Reptiles and birds.
- (g) Forelimbs are modified into wings like structures called — in flying mammals.
- (h) The arbitrary line that differentiate fauna of Oriental and Australian region is called —.

2. Answer any *eight* questions within 2-3 sentences each : 1.5×8

- (a) State three fundamental characters of chordates.
- (b) State unique characters of Hemichordates.

(3)

- (c) State significance of Ascidian tadpole larva.
- (d) State the conditions for an organ to act as an accessory respiratory organ.
- (e) State distinct characters of order-urodela.
- (f) Differentiate between cartilaginous fishes and bony fishes.
- (g) Name the different muscles associated with poison apparatus of snake.
- (h) State significance of migration in birds.
- (i) What is adaptive radiation in Mammals ?
- (j) What do you mean by continuous and discontinuous distribution of animals on earth surface.

(4)

3. Answer any *eight* questions within 75 words each : 2×8

(a) State progressive changes during metamorphosis of Ascidian tadpole larva.

(b) What is Dipleural concept ?

(c) State general characters of cyclostomes.

(d) State broad classification of Amphibians.

(e) State affinities of sphenodon.

(f) State avian characters of Archaeopteryx.

(g) State plate tectonic theory.

(h) State peculiar characters of prototheria.

(i) State general characters of Reptilia.

(5)

(j) State evolutionary significance of Dipnoi.

4. Answer the following questions within 500 words each : 6×4

(a) Describe larval form of Hemichordates.

Or

Give an account on general characters of chordates. Also give a brief outline classification of chordates.

(b) Give an account on accessory respiratory organs in pisces.

Or

Write an essay on parental care in amphibians.

(c) Briefly describe poison apparatus and biting mechanism in Snakes.

(6)

Or

Describe flight adaptations in birds.

- (d) State general characters of Mammalia and a brief classification of mammals.

Or

Write an essay on adaptive radiation in mammals with reference to locomotory appendages.

2022

ZOOLOGY

Paper-CC-VI

Full Marks : 60

Time : 3 hours

Answer all questions.

*The figures in the right-hand margin
indicate marks.*

Draw diagrams wherever necessary.

1. Fill in the blanks : 1 × 8

- (i) Contractile unit of skeletal muscle fiber is called _____.
- (ii) Connective tissue that joins muscle to bone is called _____.
- (iii) The structural and functional unit of reflex action is called _____.

(Turn Over)

(2)

- (iv) The conduction of nerve impulse in myelinated nerve fiber is called _____.
- (v) Rupture of Graffian follicle to release ovum is called _____.
- (vi) Human chorionic gonadotropin is secreted by _____.
- (vii) Endocrine part of pancreas is called _____.
- (viii) The part of pituitary gland that secretes trophic hormones is _____.

2. Answer any *eight* questions within 2-3 sentences each : 1.5×8

- (i) State functions of glial cells.
- (ii) Differentiate between bones and cartilages.
- (iii) What is action potential ?

(3)

- (iv) Name the components of a synapse.
- (v) State role of semicircular canal in physiology of hearing.
- (vi) State the functions of epididymis.
- (vii) What is corpus luteum ? State its function.
- (viii) What is contraception ? Give example.
- (ix) Name different class of hormones based on their chemical nature with examples.
- (x) State functions of Pineal gland.

3. Answer any *eight* questions within 75 words each : 2×8

- (i) Describe different types of bones briefly.

(4)

- (ii) State functions of fluid connective tissues.
- (iii) Describe cardiac muscles structure briefly.
- (iv) Explain the process of implantation in human.
- (v) Name the placental hormones and their functions.
- (vi) Describe neuromuscular junction briefly and its function.
- (vii) How action potential is generated in a nerve fiber ?
- (viii) Describe structure of neuron.
- (ix) Describe parathyroid and functions of its secretion.
- (x) Describe mechanism of action of steroid hormones.

(5)

4. Answer the following questions within 500 words each : 6 × 4

- (a) Describe briefly about structure classification and functions of epithelial tissues.

Or

What is bone resorption ? Explain the process of bone growth and resorption.

- (b) Describe ultrastructure of skeletal muscles.

Or

What is reflex action ? Describe the mechanism of reflex action briefly.

- (c) Give an account on methods of contraception in males and females briefly.

Or

(6)

What is puberty ? Describe pubertal changes in human males and females and its hormonal regulation.

(d) Describe structure of thyroid gland and functions of its secretion.

Or

Explain mechanism of hormone action of non-steroidal hormones.

Total Pages : 6

III-CC— Zoo-7

2022

ZOOLOGY

Paper-CC-VII

Full Marks : 60

Time : 3 hours

Answer all questions.

*The figures in the right-hand margin
indicate marks.*

Draw diagrams wherever necessary.

1. Fill in the blanks : 1 × 8

(i) _____ is commonly called animal starch.

(ii) When a fatty acid contain double bond in its carbon-skeleton, then it is called _____.

(Turn Over)

(2)

- (iii) The functional groups present in an amino acid are _____.
- (iv) The antibody binding site of an antigen is called _____.
- (v) The protein component of an enzyme is called _____.
- (vi) Multiple molecular forms of a single enzyme catalysing the same reaction are called _____.
- (vii) The virus infecting the bacteria is called _____.
- (viii) The causative agent of AIDS is _____.

2. Answer any *eight* questions within 2-3 sentences each : 1.5×8

- (i) What are polysaccharides ? Give examples.
- (ii) What are saturated fatty acids ? Give examples.

(3)

- (iii) What are essential amino acids ? Give their sources
- (iv) What are antigens ? Give examples.
- (v) Define simple proteins. Give examples.
- (vi) What are allosteric enzymes ? give examples.
- (vii) What are prions ?
- (viii) Differentiate between bacillus and coccus with examples.
- (ix) State the causative agent of Typhoid and how it is transmitted ?
- (x) State Lock and key theory of enzyme action.

3. Answer any *eight* questions within 75 words each : 2×8

- (i) What are monosaccharides ? State their biological importance.

(4)

- (ii) Differentiate between saturated and unsaturated fatty acids with examples.
- (iii) State general properties of α -amino acids.
- (iv) Describe H_2L_2 model of immunoglobulins
- (v) State the factors affecting rate of enzyme catalysed reaction.
- (vi) State significance of K_m and V_{max} .
- (vii) How HIV is transmitted ?
- (viii) How does microbes helps in agriculture ?
- (ix) Briefly describe about multi-substrate reactions.
- (x) Write briefly about sucrose.

(5)

4. Answer the following questions within 500 words each : 6 × 4

- (a) Write an essay on structure and biological importance of some common glycoconjugates.

Or

Briefly structure and significance of glycolipids and steroids.

- (b) Explain different levels of organisation of proteins with examples.

Or

What are immunoglobulins ? Describe various classes of immunoglobulins and their functions.

- (c) Describe mechanism of enzyme action briefly.

Or

(6)

What does enzyme kinetics mean ?
Derive Michaelis-Menten equation
and state its significance.

(d) Write an essay on reproduction in
bacteria.

Or

Give an account on tuberculosis
stating its causative agent, symptoms,
diagnosis, treatment and preventive
measures.

Total Pages : 11

III-GE-1/2— Zoo-2

2022

ZOOLOGY

Paper-GE-1/2

Full Marks : 60

Time : 3 hours

Answer from any one Group.

*The figures in the right-hand margin
indicate marks.*

GROUP—A

(Aquatic Biology)

Answer *all* questions :

1. Fill in the blanks : 1 × 8

(i) A water body surrounded by land is called _____.

(ii) A ring-shaped coral reef is called _____.

(Turn Over)

(2)

(iii) The change in temperature at different depths in the lake is called _____.

(iv) A stream that has continuous flow of surface water throughout the year is called a _____.

(v) The unit for measuring salinity is _____.

(vi) The most common sea weed product used in food industry is _____.

(vii) _____ is caused due to enrichment of waterbodies with nutrients.

(viii) The amount of oxygen necessary for bacteria to degrade organic matter in a water body at a given temperature is called _____.

2. Answer any *eight* questions within 2-3 sentences each : 1.5×8

(i) State differences between streams and rivers.

(3)

(ii) Why productivity of estuaries is more than sea or river ?

(iii) State characteristics of photic zone of a lake.

(iv) State role of dissolved gases in an lake ecosystem.

(v) How can you describe physico-chemical environment of a stream.

(vi) State the importance of continental shelf for a sea.

(vii) How density of sea water affects marine life ?

(viii) Name the sources of agricultural pollutants.

(ix) How COD is used as an index to assess water quality ?

(x) How thermal pollutants enter water body ?

(4)

3. Answer any *eight* questions within 75 words each : 2×8

- (i) State characteristics of estuaries.
- (ii) State importance of marine benthic zone.
- (iii) State significance of coral reefs.
- (iv) How dissolved solids affect freshwater ecosystem ?
- (v) What does lake morphometry indicate ?
- (vi) Give brief classification of lakes.
- (vii) State characteristics of barrier reefs. Give example.
- (viii) How marine organisms deal with fluctuations in salinity ?
- (ix) What are the causes and effects of oil spills ?

(5)

- (x) How industrial sewage can be treated ?

4. Answer the following questions within 500 words each : 6×4

- (a) Describe lakes as a freshwater ecosystem.

Or

Discuss about intertidal zones as an aquatic biome.

- (b) Describe light as physicochemical parameter of a lake ecosystem.

Or

Describe different stages of stream development.

- (c) Write an essay on sea weeds and their importance.

Or

(6)

Discuss about adaptations of deep sea organisms with examples.

- (d) Give an account on management and conservation of aquatic resources.

Or

Write an essay on sewage treatment briefly.

GROUP—B

(Food, Nutrition & Health)

Answer all questions :

1. Fill in the blanks : 1 × 8

- (i) _____ are called energy giving nutrients.
- (ii) Vitamins and minerals are required in lesser quantity for the body, hence they are called _____.

(Continued)

(7)

- (iii) Citrus fruits are rich in _____.
- (iv) The minerals that makes the bones strong are _____.
- (v) When 20% of the body weight is due to fat, then that condition is called _____.
- (vi) Marasmus is caused due to deficiency of _____.
- (vii) Night blindness is caused due to deficiency of _____.
- (viii) The causative agent of amoebic dysentery is _____.
2. Answer any *eight* questions within 2-3 sentences each : 1.5 × 8
- (i) Define balanced diet.
- (ii) What are nutrients ? Give examples.

III-GE-1/2-Zoo-2

(Turn Over)

(8)

- (iii) State nutritional needs of adolescents.
- (iv) State importance of Vitamin-D in body.
- (v) State biological functions of selenium and Zinc in the body.
- (vi) What is the common treatment for common cold and cough?
- (vii) What lifestyle modifications should be done to combat diabetes mellitus?
- (viii) How HIV transmission can be prevented?
- (ix) What is the common method of purification of water at domestic level?

3. Answer any *eight* questions within 75 words each : 2×8

(9)

- (i) How dietary pattern of pregnant and nursing mother differs?
- (ii) What are the major types of nutrients and their functions.
- (iii) Discuss iron deficiency disorders and their prevention.
- (iv) State the ways and means to overcome obesity.
- (v) Discuss drug addiction as a social health problem.
- (vi) State biological importance of vitamin-A.
- (vii) State nutritional classification of lipids.
- (viii) What are the major causes of food spoilage?

(10)

(ix) How cholera can be prevented from transmission ?

(x) State symptoms and preventive measures of ascariasis.

4. Answer the following questions within 500 words each : 6×4

(a) Discuss nutrient needs and dietary pattern for adults and elderly.

Or

Write an essay on food components and food nutrients.

(b) Give an account on water soluble vitamins stating their dietary sources and biological functions.

Or

Write an essay on carbohydrates stating their dietary sources and biological functions.

(11)

(c) What is hypertension ? Briefly describe causes and prevention of hypertension.

Or

Give an account on Kwashiorkor stating its causes, symptoms and preventive measures.

(d) Write an essay on food spoilage and their preventive measures.

Or

Give an account on Poliomyelitis.

2023

ZOOLOGY

Honours

Paper: CC-IX

Full Marks : 60

Time : 3 hours

Answer all questions.

*The figures in the right-hand margin
indicate marks.*

Draw diagram wherever necessary.

PART—I

1. Fill in the blanks: 1 × 8

(a) The partially digested food that leaves buccal cavity is called _____.

(b) Enzymes secreted by intestinal glands are collectively called _____.

(Turn Over)

(2)

- (c) The structures that prevents collapsing of trachea are _____.
- (d) Exchange of gases between blood and external air occurs at _____.
- (e) The hormone that regulate reabsorption of water in renal tubules is _____.
- (f) ABO blood group was discovered by _____.
- (g) The instrument used to measures blood pressure of human body is _____.
- (h) Reserve pace maker of heart is _____.

PART—II

2. Answer any *eight* questions within 2-3 sentences each: 1.5×8

- (a) Mastication of food
- (b) Function of bile

(3)

- (c) Intestinal Villi
- (d) Chloride shift
- (e) Pleura membrane
- (f) Malphigian corpuscles
- (g) Blood plasma
- (h) SA Node
- (i) Blood pressure
- (j) Alveoli

PART—III

3. Answer any *eight* questions within 75 words each: 2×8

- (a) Salivary glands
- (b) Chyme
- (c) Carbon-monoxide poisoning

(4)

- (d) Histology of trachea
- (e) Rh-factor
- (f) Counter current mechanism
- (g) Functions of kidney
- (h) Coronary circulation
- (i) Regulation of heart rate
- (j) Haemostasis

PART—IV

Answer *all* the questions within 500 words
each: 6 × 4

4. Briefly describe about liver and its role in digestion.

Or

Describe digestion of Carbohydrates in gastro intestinal tract.

(5)

5. Give a brief account on respiratory pigments.

Or

Describe Oxy-haemoglobin dissociation curve and the factors influencing it.

6. Briefly explain about structure of kidney and its function.

Or

Give a brief account on composition of blood and its function.

7. Describe cardiac cycle briefly.

Or

Describe structure and working of conducting myocardial fibers.

2023
ZOOLOGY
Honours

Paper: CC-VIII

Full Marks : 60

Time : 3 hours

Answer all questions.

*The figures in the right-hand margin
indicate marks.*

Draw diagrams wherever necessary.

PART—I

1. Fill in the blanks:

1 × 8

(a) In all chordates, first axial endoskeleton appear as a gelatinous rod called

_____.

(b) Skin with its derivatives together constitute _____ system.

(Turn Over)

(2)

- (c) In bony fishes, gills are covered by a bony flap called _____.
- (d) Embryonic digestive tract originates from _____ of gastrula.
- (e) The most primitive basic Kidney in vertebrates is _____.
- (f) The type of uterus found in human is _____.
- (g) Parietal eye are characteristics of _____.
- (h) The Xth Cranial nerve is called _____.

PART—II

2. Answer any *eight* questions within 2-3 sentences each: 1.5×8

- (a) Feathers
- (b) Appendicular skeleton
- (c) Epidermis
- (d) Intestinal glands

(3)

- (e) External gills
- (f) Ophisthonephrous Kidney
- (g) Mullerian duct
- (h) Aortic arches
- (i) Photoreceptors
- (j) Spinal cord

PART—III

3. Answer any *Eight* questions within 75 words each: 2×8

- (a) Epidermal scales
- (b) Types of Vertebrae
- (c) Dentition
- (d) Salivary glands
- (e) True gills

(4)

- (f) Embryonic circulation
- (g) Sinus Venosus
- (h) Duplex Uterus
- (i) Classification of receptors
- (j) Development of brain in Vertebrates.

PART—IV

Answer all questions within 500 words each:

6 × 4

4. Give an account on epidermal derivatives of integument.

Or

Give a comparative account of skull in vertebrate series.

5. Describe air sacs in birds.

Or

(5)

Give a comparative account on digestive glands in Vertebrate Series.

6. Describe evolution of heart in Vertebrate series.

Or

Explain succession of Kidney in vertebrate classes.

7. Describe auditory receptor in man.

Or

Give comparative account of spinal cord in Vertebrates.

2023

ZOOLOGY

Paper- CC -XI

Full Marks : 60

Time : 3 hours

Answer from **all** the Parts as directed.

*The figures in the right-hand margin
indicate marks.*

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

Draw diagrams wherever necessary.

PART—I

1. Fill in the blanks:

1 × 8

(a) Sticky ends of linear chromosomes are
called _____.

(Turn Over)

(2)

- (b) Polycistronic m-RNA are characteristics of _____.
- (c) In prokaryotes, _____ of RNA polymerase identify initiation site for transcription.
- (d) The 5'CAP of eukaryotic m-RNA contains _____ sequence.
- (e) The coding sequences of a gene are called _____.
- (f) Split genes were discovered by _____.
- (g) In an operon, _____ genes transcribe m-RNA.
- (h) _____ proteins stabilises DNA double helix and does not allow separation of two strands.

(3)

PART—II

2. Answer any *eight* questions within 2-3 sentences each. 1.5 × 8
- (a) Chorgaff's rule
 - (b) Nucleotide
 - (c) RNA primer
 - (d) Template strand
 - (e) Wobble hypothesis
 - (f) Charging of t-RNA
 - (g) Globin m-RNA
 - (h) Splicesosome
 - (i) siRNA
 - (j) Repressor elements

(4)

PART—III

3. Answer any *eight* questions within 75 words each: 2×8

- (a) Nucleic acid cot curves.
- (b) Semi-conservative DNA replication
- (c) Pyrimidine dimerization
- (d) Transcription unit
- (e) r-RNA
- (f) Difference between prokaryotic and eukaryotic translation
- (g) Exon shuffling
- (h) Introns
- (i) Activators
- (j) Gene silencing

V-CC-ZOO-XI

(Continued)

(5)

PART—IV

4. Answer *all* the questions within 500 words each: 6×4

- (a) Describe Watson and Crick model of DNA.

Or

Explain replication of circular double stranded DNA.

- (b) Give an account of RNA polymerase in prokaryotes.

Or

Describe genetic code briefly.

- (c) Explain processing of t-RNA briefly.

Or

Describe splicosomal pathway of splicing mechanism.

V-CC-ZOO-XI

(Turn Over)

(6)

(d) Describe transcription regulation in prokaryotes taking Lac operon as an example.

Or

Describe transcription regulation in eukaryotes briefly.

2023

ZOOLOGY

Honours

Paper: CC - X

Full Marks : 60

Time : 3 hours

Answer all questions.

*The figures in the right-hand margin
indicate marks.*

Draw diagram wherever necessary.

PART—I

1. Fill in the blanks:

1 × 8

(a) Energy is released during _____ stage of catabolism.

(b) Segregation of metabolic pathways into different sub-cellular organelles is called _____.

(Turn Over)

(2)

- (c) One glucose molecule through glycolysis generates a net gain of _____ ATP.
- (d) The hormone that stimulate glycolysis is _____.
- (e) Synthesis of Ketone bodies in the body is called _____.
- (f) The alternative name for urea cycle is _____.
- (g) _____ is the terminal acceptor of electrons in ETS.
- (h) ATP synthesising enzyme complex associated with Fo-F₁ particle is _____.

PART—II

2. Answer any *Eight* questions within 2-3 sentences each: 1.5×8

- (a) Anabolism

IV-CC-ZOO-X

(Continued)

(3)

- (b) ATP
- (c) Coupled reactions
- (d) Regulation of glycolysis
- (e) Significance of gluconeogenesis
- (f) Ketone bodies
- (g) Glucogenic amino acids
- (h) Deamination
- (i) Ubiquinone
- (j) Significance of ETC

PART—III

2. Answer any *eight* questions within 75 words each:

2×8

- (a) Reducing equivalents
- (b) Compartimentalization of metabolic pathways.

IV-CC-ZOO-X

(Turn Over)

(4)

- (c) Glycogenesis
- (d) Fate of pyruvic acid.
- (e) Omega-Oxidation of saturated fatty acids.
- (f) Transamination of amino acids
- (g) Uncouplers
- (h) Malate-Oxaloacetate-Aspartate shuttle system.
- (i) Ketogenesis
- (j) Components of ETS

PART—IV

Answer *all* questions within 500 words each:
6 × 4

4. Describe stages of catabolism with example.

Or

Describe Malate-Aspartate shuttle .

(5)

system to transport reducing equivalents from cytoplasm to mitochondrial matrix.

5. Describe citric acid cycle briefly.

Or

Describe gluconeogenesis briefly and state its significance.

6. Describe β -oxidation of saturated fatty acids with even carbon atom.

Or

Explain fate of carbon skeleton of Ketogenic amino acids.

7. Write an essay on inhibitors of ETS.

Or

Describe the mechanism of flow of electrons in ETS from substrates.

2023

ZOOLOGY

Paper- CC -XII

Full Marks : 60

Time : 3 hours

Answer from **all** the Parts as directed.

*The figures in the right-hand margin
indicate marks.*

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

PART—I

1. Fill in the blanks.

1 × 8

(a) The exchange of DNA segment between
a pair of homologous chromosomes is
called _____.

(Turn Over)

(2)

- (b) The phenomenon in which a single gene affects two or more characters is called _____.
- (c) Any sudden change in the genome of an individual which is inheritable is called _____.
- (d) The frequency with which genes mutate spontaneously is called _____.
- (e) The units of cytoplasmic inheritance is called _____.
- (f) Types of gametes produced by a heterogametic female are _____.
- (g) Recombination in bacteria involving bacteriophage is called _____.
- (h) Jumping genes within a genome that affect expression of genes are called _____.

(3)

PART—II

2. Answer any *eight* questions within 2-3 sentences each: 1.5 × 8

- (a) Lethal alleles
- (b) Interference
- (c) Polygenic inheritance
- (d) Frame shift mutation
- (e) Polyploidy
- (f) Photo-product
- (g) Male haploidy
- (h) Kappa particles in *Paramecium*
- (i) Hfr strain of bacteria
- (j) Complementation test

(4)

PART—III

3. Answer any *eight* questions within 75 words each: 2×8

- (a) Sex-linked inheritance
- (b) Polygenic inheritance
- (c) Multiple alleles
- (d) Euploidy
- (e) Chemical mutagens
- (f) Attached X-method of detection of mutation
- (g) Genic balance mechanism of sex determination
- (h) Criteria for extra chromosomal inheritance
- (i) Conjugation in bacteria

(5)

(j) Transposons in human

PART—IV

4. Answer *all* questions within 500 words each: 6×4

- (a) Describe briefly principles of inheritance.

Or

Explain the technique of somatic cell hybridization. State its significance.

- (b) Give an account on types of chromosomal aberrations with examples.

Or

Explain molecular basis of mutation in relation to UV light.

- (c) Describe chromosomal basis of sex-determination in human.

(6)

Or

Describe antibiotic resistance in *Chlamydomonas* as an example of extra chromosomal inheritance.

(d) Explain the mechanism of Transformation in bacteria.

Or

Give an account on transposons in bacteria.

2023

ZOOLOGY

Paper- DSE-I

Full Marks : 60

Time : 3 hours

Answer any **one** Group as directed.

*The figures in the right-hand margin
indicate marks.*

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

Draw diagrams wherever necessary.

GROUP—A

ANIMAL BEHAVIOUR &
CHRONOBIOLOGY

Answer from **all** the Parts as directed.

(Turn Over)

(2)

PART—I

1. Fill in the blanks:

1 × 8

(a) The person who discovered the language of honeybee was _____.

(b) A stereotyped, unlearned, genetically determined behaviour is called _____.

(c) _____ is a form of non-associative learning where stimulus is not associated with any reward or punishment.

(d) _____ behaviour protect our body from harmful stimulus.

(e) The type of honey bee movement that occurs to indicate the direction of abundance of food source is called _____.

(f) The Behavioural pattern shown by members of one sex for preferred mating with members of opposite sex is called _____.

V-DSE-ZOO-I

(Continued)

(3)

(g) _____ hormone is produced by brain in response to darkness.

(h) Rhythmic behaviour caused due to movement of the moon and the tides is called _____.

PART—II

2. Answer any *eight* questions within 2-3 sentences each: 1.5 × 8

(a) Code breaker

(b) Objective of behaviour

(c) Reflexes

(d) Instinct behaviour

(e) Foraging in honey bees

(f) Sexual dimorphism

(g) Circadian rhythm

V-DSE-ZOO-I

(Turn Over)

(4)

- (h) Non-photic zeitgebers
- (i) Role of Melatonin
- (j) Long term biological rhythms

PART—III

3. Answer any *eight* questions within 75 words each: 2×8

- (a) Karl Von Frisch
- (b) Role of behaviour in evolution
- (c) Proximate behaviour
- (d) Orientation
- (e) Imprinting
- (f) Female choice in intersexual selection.
- (g) Asymmetry of sex.
- (h) Chronobiology

(5)

- (i) Phase & period of biological oscillation.
- (j) Photoperiod

PART—IV

4. Answer *all* questions within 500 words each: 6×4

- (a) Discuss the role of Ivon Pavlov to animal behaviour.

Or

Discuss behaviour as a discipline of science.

- (b) Discuss various individual behavioural pattern briefly.

Or

Describe classical and operant conditioning with examples.

(6)

- (c) Give an account on social behaviour of honey bee.

Or

Discuss various sexual behaviour briefly.

- (d) What is biological clock ? Discuss its adaptive significance and relevance.

Or

Discuss regulation of seasonal reproduction of vertebrates with relation to photoperiod.

GROUP—B

ANIMAL BIOTECHNOLOGY

Answer from *all* the Parts as directed

PART—I

1. Fill in the blanks: . 1 × 8

- (a) A cloning vector having both properties of bacteriophage and plasmid is called _____.

V-DSE-ZOO-I

(Continued)

(7)

- (b) Use of short high voltage pulses to transform a cell is called _____.

- (c) Transfer of nucleic acid fragments from gel to nitrocellulose filter paper is called _____.

- (d) Conversion of dsDNA to ssDNA strand by applying any agent is called _____.

- (e) Transplantation of non-human animal organ or tissue into human body is called _____.

- (f) Transgenic sheep Dolly was produced by _____ method.

- (g) Gene therapy strategy adopted to silence a defective gene is called _____.

- (h) The expression vector used for recombinant human growth hormone production is _____.

V-DSE-ZOO-I

(Turn Over)

(8)

PART—II

2. Answer any *eight* questions within 2-3 sentences each: 1.5×8

- (a) Plasmid
- (b) Restriction enzymes
- (c) Expression vectors
- (d) Amplification cycle in PCR.
- (e) Western blotting
- (f) Bioreactors
- (g) Transgenic mice application
- (h) Himuten
- (i) Ex-vivo gene therapy
- (j) Cystic fibrosis

V-DSE-ZOO-I

(Continued)

(9)

PART—III

3. Answer any *eight* questions within 75 words each: 2×8

- (a) Cloning vectors
- (b) Genomic libraries
- (c) Cloney screening by plaque hybridization method.
- (d) DNA microarray
- (e) Application of Southern blotting technique.
- (f) Pharmaceuticals production by transgenic animals.
- (g) DNA microinjection method of transgenesis.
- (h) Molecular diagnosis of Sickel cell anemia.

V-DSE-ZOO-I

(Turn Over)

(10)

- (i) Recombinant human growth hormone.
- (j) Primary cell culture.

PART—IV

4. Answer *all* questions within 500 words each: 6 × 4

- (a) Give an account on scope of biotechnology.

Or

Discuss various transformation technique briefly.

- (b) Describe Sanger's method of DNA sequencing.

Or

Describe the technique of Northern blotting technique and its application.

(11)

- (c) Write an essay on application of transgenic animals.

Or

Describe Nuclear transplantation method of transgenesis.

- (d) Write an essay on animal cell culture and its application.

Or

Discuss molecular diagnosis of Thalassemia and Haemophilia.

GROUP—C

ENDOCRINOLOGY

Answer from *all* the Parts as directed.

PART—I

1. Fill in the blanks: 1 × 8

- (a) _____ part of pituitary gland secretes neurohormones.

(12)

- (b) The tissues on which hormones show their action are called _____.
- (c) Pineal gland secretes _____.
- (d) The structure that coordinates between nervous system and endocrine system is _____.
- (e) Testicular cells that secrete testosterone are _____.
- (f) The inorganic ion that helps in maturation of thyroid hormone is _____.
- (g) Steroid hormone receptors are present on _____ of target cells.
- (h) The most common second messenger that mediates hormone action is _____.

(13)

PART—II

2. Answer any *eight* questions within 2-3 sentences each: 1.5 × 8

- (a) Characteristics of hormones
- (b) Neurotransmitters
- (c) Feedback mechanism of hormone secretion.
- (d) Vasopressin
- (e) Pituitary adenomas
- (f) Calcitonin
- (g) Parathyroid gland
- (h) Peptide hormone receptors
- (i) Prolactin
- (j) cAMP as second messenger

(14)

PART—III

3. Answer any *eight* questions within 75 words each: 2×8

- (a) Steroid hormones
- (b) Transport of hormones
- (c) Cushing's syndrome
- (d) Diabetes insipidus
- (e) Islets of Langerhans
- (f) Progesterone
- (g) Posterior pituitary gland secretions
- (h) Follicle stimulating hormone
- (i) Molecular mediators
- (j) Ca^{+2} & calmodulin as second messenger.

(15)

PART—IV

4. Answer *all* questions within 500 words each: 6×4

- (a) Write a brief account on history of endocrinology.

Or

Briefly describe about types of endocrine glands & their hormones.

- (b) Describe the role of pineal gland in biological rhythm & reproduction.

Or

Discuss about structure of anterior pituitary glands, its secretions and functions.

- (c) Discuss about role of hormones in homeostasis.

Or

(16)

Describe structure, hormones and functions of thyroid gland.

(d) Describe mechanism of hormone action at molecular level.

Or

Discuss about peptide hormone receptors & their role in transduction & regulation of hormone action.

Total Pages :15

V-DSE-ZOO-II

2023

ZOOLOGY

Paper- DSE-II

Full Marks : 60

Time : 3 hours

Answer from any one Group.

*The figures in the right-hand margin
indicate marks.*

Draw diagrams whenever necessary.

GROUP—A

BASICS OF NEUROSCIENCES

Answer from all the Parts as directed.

PART—I

(Turn Over)

(2)

1. Fill in the blanks:

1 × 8

(a) Resting membrane potential of a neuron is _____.

(b) Midbrain, pons and medulla oblongata together form _____.

(c) The point of contact between two neurons is called _____.

(d) The part of the temporal lobe of brain associated with learning & memory is _____.

(e) Peptidergic neurotransmitters are found in _____.

(f) Ligand-gated ion channels are commonly referred to as _____.

(g) The portion of the nervous system responsible for processing input from the environment forms _____.

(3)

(h) The first step of signal transduction is _____.

PART—II

2. Answer any *eight* questions within 2-3 sentences each: 1.5 × 8

(a) Peripheral nervous system.

(b) Neuron doctrine.

(c) Mid-brain.

(d) Action potential.

(e) Synaptic function.

(f) Saltatory conduction.

(g) Catecholamines.

(h) Metabotropic receptors.

(i) Parkinson's disease.

(4)

(j) Principle of signal transduction.

PART—III

3. Answer any *eight* questions within 75 words each: 2×8

- (a) Medulla oblongata
- (b) Neuroglia
- (c) Axons and dendrites
- (d) Properties of action potential
- (e) Types of synapse.
- (f) EPSP and IPSP.
- (g) Amino-acidergic neurotransmitters.
- (h) G-protein coupled receptors.
- (i) Gustatory sensory system.
- (j) Molecular basis of memory.

(5)

PART—IV

4. Answer *all* questions within 500 words each: 6×4

(a) Describe the structure of neuron with diagram.

Or

Describe the structure of cerebellum and its function.

(b) Explain the process of synaptic transmission.

Or

Explain the process of generation and conduction of action potential in a myelinated nerve fiber.

(c) What are neurotransmitters ? Discuss different types of neurotransmitters briefly.

(6)

Or

Discuss different types of neurotransmitter receptors & their function.

(d) Write an essay on psychological disorders.

Or

Describe functional properties of neural system with behaviour.

GROUP—B

REPRODUCTIVE BIOLOGY

Answer from all the Parts as directed.

PART—I

1. Fill in the blanks:

1 × 8

(a) Gonads develop from _____ layer of embryo.

V-DSE-ZOO-II

(Continued)

(7)

(b) Interconnected network of fine tubules located in the mediastinum of the testis is called _____.

(c) Differentiation of spermatids into spermatozoa is called _____.

(d) Testicles in human are held outside the body in a sac called _____.

(e) Rupture of graffian follicle to release ovum is called _____.

(f) Cells of ovary that secrete oestrogen are _____.

(g) The technique of injecting single sperm into each egg is called _____.

(h) Surgical blocking of fallopian tube to prevent pregnancy is called _____.

PART—II

2. Answer any eight questions within 2-3 sentences each: 1.5 × 8

V-DSE-ZOO-II

(Turn Over)

(8)

- (a) Male genital ducts.
- (b) Sex steroids.
- (c) Prostate gland.
- (d) Leydig cells
- (e) Semen.
- (f) Corpus luteum.
- (g) Vitellogenesis.
- (h) Gestation period
- (i) Frozen embryos.
- (j) Infertility in human males.

PART—III

3. Answer any *eight* questions within 75 words each: 2×8

- (a) External genitalia in females.

(9)

- (b) Regulation of gonadotrophin secretion in males.
- (c) Structure of spermatozoa.
- (d) Epididymis
- (e) Seminiferous tubules.
- (f) Prevention of polyspermy.
- (g) Lactation.
- (h) Ovum transport in fallopian tube.
- (i) ART.
- (j) GIFT.

PART—IV

4. Answer *all* questions within 500 words each: 6×4

- (a) Describe development and differentiation of male gonads in human.

(10)

Or

Give an account on gonadal hormones and their mechanism of hormone action.

- (b) Briefly describe the process of spermatogenesis.

Or

Describe male reproductive system in human.

- (c) Describe menstrual cycle in human.

Or

Describe mechanism of parturition and its hormonal regulation.

- (d) Give an account of modern contraceptive technologies.

Or

(11)

Give an account on diagnosis and management of male and female infertility.

GROUP—C

IMMUNOLOGY

Answer all of the Parts as directed.

PART—I

1. Fill in the blanks:

1 × 8

- (a) Largest anatomical barrier of the body is _____.

- (b) Immunity acquired through genes is called _____.

- (c) Incomplete antigens are called _____.

- (d) _____ immunoglobulin cross the placental barrier to provide immunity to factors.

- (e) MHC molecules involved in antigen presentation through exogenous pathway is _____.

(12)

- (f) MHC gene complex is present in chromosome _____ of human gene.
- (g) Concept of immunisation was accidentally developed by _____.
- (h) Vaccines used for treatment purpose against any disease condition are called _____.

PART—II

2. Answer any *eight* questions within 2-3 sentences each: 1.5×8

(a) Innate immunity

(b) Autoimmunity

(c) Macrophages

(d) Immunogens

(e) Adjuvants

(13)

(f) Paratopes

(g) MHC-class-III molecules

(h) Interleukins

(i) Recombinant vaccines

(j) Type-V Hypersensitivity

PART—III

3. Answer any *eight* questions within 75 words each: 2×8

(a) Instruction theory of antibody formation.

(b) Spleen

(c) Tolerance

(d) ELISA

(e) Antigens

(14)

- (f) B-Cell Epitopes
- (g) Therapeutic cytokines
- (h) Membrane Attack Complex
- (i) Conjugate vaccines
- (j) Delayed type hypersensitivity

PART—IV

4. Answer *all* questions within 500 words each: 6 × 4

- (a) Write an essay on adaptive immunity.

Or

Describe AIDS as an example of immune dysfunction.

- (b) Describe structure and function of different class of immunoglobulins.

Or

(15)

Or

Give an account of antigens stating its structure & classification.

- (c) Describe structure and function of MHC class-I molecules.

Or

Describe endogenous pathway of antigen presentation.

- (d) Describe Gell & Coomb's classification of hypersensitivity.

Or

Write an essay on edible vaccines, their advantages & limitations.

2024

ZOOLOGY

(Developmental Biology)

Paper — CC-ZOO-13

Full Marks : 60

Time : 3 hours

Answer **all** questions

The figures in the right-hand margin indicate marks

Draw diagrams wherever necessary

PART — I

1. Fill in the blanks : 1 × 8

(a) The fully formed gastrula encloses a central cavity called _____ which is lined on all sides by endoderm.

(b) _____ egg membranes are produced by the follicle cells around the developing oocytes of the ovary.

(Turn Over)

(2)

- (c) _____, 1929 invented the vital dye marking method of construction of fate map of developing amphibian embryo.
- (d) Cleavage in polylecithal egg is _____ type confined only to the germinal disc region.
- (e) There is only a specific period of time, called _____ during which implantation of embryo in humans is possible.
- (f) Most marsupials having yolkless small eggs develop a large and highly vascular yolk-sac which gets fused broadly with the chorion to form _____ placenta.
- (g) Embryonic stem cells are _____ in nature as these can divide in self-renewal into more stem cells or have total potential to develop into any cell type in the body.

(Continued)

(3)

- (h) In planarians and in *Hydra*, the undifferentiated cells called _____ multiply and then migrate from the deeper parts of the body to the cut surface to cause regeneration.

PART— II

2. Answer any *eight* questions within *two to three* sentences each : $1\frac{1}{2} \times 8$
- (a) What is cell-cell interaction ?
- (b) Explain fertilizin – antifertilizin reaction.
- (c) What is cortical reaction ?
- (d) What are the characteristics of cleavage ?
- (e) What is primitive streak ?
- (f) State the fate of embryonic endoderm.

(Turn Over)

(4)

- (g) Write the functions of yolk sac.
- (h) What is autotomy ? Give one example.
- (i) What is the effect of sedatives in teratogenesis ?
- (j) Write the significance of amniocentesis.

PART— III

3. Answer any *eight* questions within 75 words each : 2×8

- (a) Ootidogenesis.
- (b) Distinguish between external and internal fertilization.
- (c) Blocks to polyspermy.
- (d) Types of blastula.

(5)

- (e) Neural induction.
- (f) Decidualisation.
- (g) Histological classification of placenta.
- (h) Retrogressive changes in metamorphosis of Anuran tadpole larva.
- (i) Error catastrophe theory of ageing.
- (j) In Vitro Fertilisation.

PART— IV

4. Answer *all* questions within 500 words each : 6×4

- (a) What is differential gene expression ? Describe the process of differential gene expression.

(6)

Or

Define gametogenesis. Give an account of mechanism of spermatogenesis.

(b) What is cleavage ? Describe the different planes and patterns of cleavage.

Or

Discuss the early development of frog embryo up to gastrulation.

(c) What are extra embryonic membranes ? Describe the mode of development and functions of extra embryonic membranes in birds.

Or

Give an account of the structure and types of placenta in mammals.

(7)

(d) What is metamorphosis ? Describe the process of metamorphosis and its hormonal regulations in amphibians.

Or

Define regeneration. Explain the different modes of regeneration with suitable examples.

Total Number of Pages—7

VI-CC—Zoo-14

2024

ZOOLOGY

(*Evolutionary Biology*)

Paper — CC-ZOO-14

Full Marks : 60

Time : 3 hours

Answer all questions

The figures in the right-hand margin indicate marks

PART — I

1. Fill in the blanks :

1 × 8

(a) The first evolved "cell like" structures with division power were called _____.

(Turn Over)

(2)

- (b) The _____ era is referred to as the age of mammals.
- (c) The type of natural selection that favours extreme expressions of certain traits to increase variance in a population is called _____ selection.
- (d) _____ is the fundamental raw material of evolution which restores genetic variation eliminated by selection.
- (e) The evolution that operates to change the genetic equilibrium in a Mendelian population and occurs below the species level is called _____.
- (f) The different mating rituals of animal species create extremely powerful reproductive barriers, termed as _____ isolation.

(3)

- (g) _____ is considered to be the closest extinct ancestor of modern human beings.
- (h) _____ is the most commonly used phylogenetic method used in research papers and it is ideal for phylogeny construction from sequence data.

PART — II

2. Answer any *eight* questions within *two to three* sentences each : $1\frac{1}{2} \times 8$
- (a) State and explain RNA world.
- (b) What is recapitulation theory ?
- (c) Write about geological time scale.
- (d) Which evolutionary forces upset H-W equilibrium ?
- (e) What is selection coefficient ?

(4)

- (f) Define species concept.
- (g) What are clines ?
- (h) State the essential features of macro-evolution.
- (i) What are the unique hominin characteristics ?
- (j) Define phylogenetic tree.

PART — III

3. Answer any *eight* questions within 75 words each : 2×8

- (a) Types of fossils.
- (b) Mutation as a source of genetic variation.
- (c) Mass extinction.

(5)

- (d) Heterozygous superiority.
- (e) Bottle-neck phenomenon.
- (f) Role of migration in changing allelic frequencies.
- (g) Significance of isolating mechanisms.
- (h) Sympatric speciation.
- (i) Cro-Magnon man.
- (j) Molecular analysis of human origin.

PART — IV

4. Answer *all* questions within 500 words each : 6×4

- (a) Describe Darwin's theory of Natural selection in brief. Add a note on Neo-Darwinism.

(6)

Or

Give an account of the process of evolution in horse.

- (b) State Hardy-Weinberg law of equilibrium. Derive the equation for the law and discuss its application to human population.

Or

What is natural selection ? Explain its mechanism of working and types of selection.

- (c) What is isolation ? Describe different mechanisms of isolation and its role in speciation.

Or

What is macro-evolution ? Discuss its mechanism exemplified by Galapagos finches.

(7)

- (d) Discuss briefly the origin and evolution of man.

Or

Discuss about Hominin. How their characteristics are contrasted with primate characteristics ?

2024

ZOOLOGY

Paper — DSE-ZOO-3

Full Marks : 60

Time : 3 hours

Answer from any one Group as per your
specialization

Answer all questions

The figures in the right-hand margin indicate marks

GROUP— A

(Fish and Fisheries)

PART— I

1. Fill in the blanks : 1 × 8

(a) An ideal electric organ consists of a large
number of disc-shaped cells called
_____.

(Turn Over)

(2)

- (b) The condition in which the eggs of some bony fishes simply develop within the female and the young emerges when the eggs hatch is called _____.
- (c) In West Bengal and neighbouring areas a standard sized fry net called _____ is used for collection of fries from rivers and other breeding grounds.
- (d) The full form of EEZ is _____.
- (e) Algal blooms and oxygen depletion in a brood stock pond are controlled by _____ exchange.
- (f) The predatory fish feeding on other fishes in a pond is called _____ fish.
- (g) Spring Viremia of Carp (SVC) is caused by infection of a _____ virus.

(3)

- (h) Faster growth in transgenic fishes is usually accomplished by transferring a fish _____ gene from one species of fish into another.

PART— II

2. Answer any *eight* questions within *two to three* sentences each : $1\frac{1}{2} \times 8$
- (a) What are different types of scales in fishes ?
- (b) State the functions of swim bladder in fishes.
- (c) What is catadromous migration ?
- (d) What are hatching pits ?
- (e) Which environmental factors influence seasonal variation in fishes ?

(4)

- (f) State the potential of sustainable aquaculture.
- (g) State the functions of aquaria filters.
- (h) Write about Viral Haemorrhagic Septicaemia.
- (i) What is chilled storage of fishes?
- (j) State the medicinal products obtained from fishes.

PART— III

3. Answer any *eight* questions within 75 words each : 2×8

- (a) General characteristics of class Chondrichthyes.
- (b) Modifications of caudal fin in fishes.

(5)

- (c) Hydrodynamics.
- (d) Major causes of depletion of fishery resources.
- (e) Fishery regulations.
- (f) Distinguish between extensive and intensive fish farming systems.
- (g) Induced breeding.
- (h) Factors affecting aquaculture.
- (i) Isinglass.
- (j) Applications of Zebra fish in research.

PART— IV

4. Answer *all* questions within 500 words each : 6×4

(6)

- (a) Describe various types of gills and the mechanism of gaseous exchange in fishes.

Or

Give an account of different types of locomotion found in fishes and their significance.

- (b) State the major types of devices used to capture fishes ? Discuss about different types of marine fishing crafts and gears used in India.

Or

Describe the causes of depletion of fishery resources and the control measures to over-come them.

- (c) What is aquaculture ? Write an essay on sustainable aquaculture and the key challenges faced by Aquaculture Sector.

(7)

Or

Give an account of management of fin fish hatcheries in India.

- (d) Describe the bacterial diseases found in fishes and their methods of treatment.

Or

What is transgenic fish ? Give an account of the techniques used for development of transgenic fishes.

GROUP- B

(Wildlife Conservation and Management)

PART- I

1. Fill in the blanks :

1 × 8

(8)

- (a) The Indian wild life Act was launched in _____ September, 1972.
- (b) Variation seen in habitat which affords protection of animals or shelters to the animals from weather, predators or enemies by offering a better guarding point is called _____.
- (c) Some disturbances which influence the process of succession and create hurdles for stabilization of a community are termed as _____.
- (d) _____ is the most common illegally traded wild life in India.
- (e) Population density per unit of habitat space that actually is colonized by the population is called _____ density.

(9)

- (f) The highly pathogenic influenza A virus subtype _____ is an emerging avian influenza virus that is causing global concern as a potential pandemic threat.
- (g) _____ is the India's first planned eco-tourism destination located in the foot hills of the Western Ghats, in Kollam district of Kerala.
- (h) The _____ Tiger Reserve, the seventh in Madhya Pradesh and the 54th in India has been established by the state government.

PART- II

2. Answer any *eight* questions within *two* to *three* sentences each : $1\frac{1}{2} \times 8$
- (a) Write down the negative values of wild life.

(10)

- (b) What are the rarest wild animals in Odisha ?
- (c) What is topography ? State its importance.
- (d) Write about the mechanical treatment methods of wild life habitat.
- (e) What is cryopreservation ?
- (f) Define and explain natality.
- (g) How do you take care of injured and diseased animals ?
- (h) What is anthrax ? Write its symptoms.
- (i) State concept of climax persistence.
- (j) What is community reserve ?

(11)

PART- III

3. Answer any *eight* questions within 75 words
each : 2 × 8
- (a) Importance of wild life conservation.
 - (b) Conservation and protection Laws of wild life.
 - (c) Biological parameters of wild life.
 - (d) Wild life (Protection) Act, 1972 of India.
 - (e) Differentiate between *In situ* and *Ex situ* conservation.
 - (f) Restoration of degraded habitats.
 - (g) Clinical significance of faecal analysis.

(12)

- (h) Census method of wild life population estimation.
- (i) Distinguish between national parks and wild life sanctuaries.
- (j) Important features of protected areas in India.

PART – IV

4. Answer *all* questions within 500 words each : 6 × 4

- (a) What is wild life depletion ? Discuss the major causes of decline or extermination of wild life.

Or

What do you mean by Remote Sensing and GIS ? Describe their applications in wild life monitoring.

(13)

- (b) What is genetic diversity ? Discuss the methods of conservation of general genetic diversity.

Or

What is wild life trade ? Give an account of major challenges in tackling wild life crime in India and related laws.

- (c) Describe the methods for faecal sample collection and slide preparation for faecal analysis of carnivores.

Or

Give an account of bacterial and viral diseases in wild animals and their prevention measures.

- (d) What is Eco tourism ? Give an account of Eco tourism in India and its importance.

Or

Write an essay on Tiger reserves in India and the management challenges encountered in Tiger reserves.
