

Bajaj College of Science, Wardha

Practice Sheet During Lockdown

M.Sc._Zoology Sem II

Paper- V - Structure and Function of Vertebrates

Unit-I

Long Questions---

1. Describe Origin and ancestry of Chordata.
2. Write detailed account on General organization and affinities of Cephalochordata.
3. Describe Structure, development and metamorphosis of Amoecoetus.
4. Describe General characters and affinities of Dipnoi.

Short questions—write an account on—

1. Origin of Chordata.
2. affinities of Cephalochordata.
3. Structure of Amoecoetus.
4. metamorphosis of Amoecoetus.
5. General characters of Dipnoi.
6. affinities of Dipnoi.

Unit-II

Long questions—

1. Comparative account of Organs and mechanism of respiration in Pisces and Amphibia.
2. Describe Vertebrate integument and its derivatives.
3. Comparative account of Appendicular skeleton (Limbs and girdles) in Amphibia and Mammals.

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4. Comparative account of Appendicular skeleton (Limbs and girdles) in Reptilia and Aves.
5. Comparative account of Appendicular skeleton (Limbs and girdles) in amphibia and aves.
6. Describe General body organization and classification in Chelonia.

Short questions—write an account on—

1. Organs of respiration in Pisces and Amphibia .
2. Organs and mechanism of respiration in Pisces .
3. Organs and mechanism of respiration in Amphibia.
4. Vertebrate integument
5. derivatives of Vertebrate integument.
6. Appendicular skeleton (Limbs and girdles) in Amphibia.
7. Appendicular skeleton (Limbs and girdles) in Reptilia.
8. Appendicular skeleton (Limbs and girdles) in Aves.
9. Appendicular skeleton (Limbs and girdles) in Mammals.
10. classification in Chelonia.

Unit-III

Long questions ---

1. Describe Evolution of urinogenital organs in vertebrates.
2. Describe Origin of Birds.
3. Describe general characters and adaptations in ceatacea.
4. Describe Comparative anatomy of the brain in vertebrates (teleost, frog, lizard, fowl and rat).

Short questions—write an account on—

1. Evolution of urinogenital organs in vertebrates.
2. Origin of Birds.
3. Cetacia: general characters

4. Cetacia: adaptations.
5. brain of teleost
6. brain of frog
 brain of lizard
7. brain of fowl
8. brain of rat.

Unit- IV

Long questions—

1. Describe Autonomous nervous system in vertebrates: structure and functions.
2. Describe Evolution of heart in vertebrates.
3. Describe Sense organs in vertebrates.
4. Describe Evolution of Man.

Short questions—write an account on—

1. Structure of Autonomous nervous system in mammals.
2. Mammalian heart
3. Amphibian heart
4. Crocodilian heart
5. Reptilian heart
6. Phtotoreceptor in vertebrates
7. Phonoreceptor in vertebrates
8. Mechanoreceptor in vertebrates.
9. Australopithecus .
10. Neanderthals
11. *Homo sapiens*

Paper VI – Comparative Endocrinology)

Subject : Zoology

Unit I

Long Questions

1. Discuss in detail the neurosecretory hormones and their functions in Coelenterate Phylum?
2. Discuss in detail the neurosecretory hormones and their functions in Helminth Phylum?
3. Describe in detail the neurosecretory system in Annelid Phylum? Add a note on hormones and their function of Annelid Animals.
4. Explain the complete setup of Neuroendocrine system in Mollusca Animals, alongwith hormones types and their functions?
5. Discuss in detail the neurosecretory hormones and their functions in Echinodermata Phylum?

Short Questions

1. Neurosecretory Hormones in Animals of Coelenterate Classes
2. Functions of Neurosecretory Hormones in Animals of Coelenterate Classes
3. Neurosecretory Hormones in Animals of Helminth Phylum
4. Functions of Neurosecretory Hormones in Animals of Helminth Phylum
5. Structure of Neurosecretory System in Animals of Annelida Phylum
6. Hormones of Neurosecretory System in Animals of Annelida Phylum
7. Functions of Neurosecretory System in Animals of Annelida Phylum
8. Structure of Neuroendocrine System in Animals of Mollusca Phylum
9. Hormones of Neuroendocrine System in Animals of Mollusca Phylum
10. Functions of Neuroendocrine System in Animals of Mollusca Phylum
11. Neurosecretory Hormones in Echinodermata classes
12. Functions of Neurosecretory Hormones Echinoderm Classes

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Unit II

Long Questions

1. Explain the setup and hormones of Neuroendocrine system in animals of class Crustacea?
2. Discuss in detail the neuroendocrine mechanism of metamorphosis and reproduction in animals of class Crustacea?
3. State neuroendocrine mechanism of reproduction and colour change in animals of class Crustacea?
4. Discuss in detail the cephalic neuro-endocrine system in class Insecta, alongwith its hormones?
5. Discuss in detail the endocrine control of metamorphosis in animals of class Insecta?
6. Describe in detail the endocrine control of reproduction in Insects?

Short Questions

1. Structure of Neuroendocrine system in class Crustacea
2. Functions of Neuroendocrine system in class Crustacea
3. Endocrine control of metamorphosis in crustaceans
4. Endocrine control of reproduction in crustaceans
5. Endocrine control of colour change in crustaceans
6. Brain set up in Insects
7. Cephalic neuroendocrine system in Insects
8. Insect Hormones
9. Neuroendocrine control of metamorphosis in Insects
10. Endocrine control of reproduction in Insects

Unit-III

Long Answer Questions--

1. Describe Pineal organ: structure, hormones and functions.
2. Describe Hypothalamo hypophysial system and its function.

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3. Describe Pituitary gland.
4. Describe Thyroid gland.

Short Answer Questions—write an account on --

1. structure of Pineal organ of mammal
2. functions of Pineal organ.
3. hormones of hypothalamus.
4. Structure of Pituitary of mammal
5. cell types of Pituitary
6. hormones of Pituitary .
7. structure of Thyroid gland of mammal
8. function of Thyroid gland.

Unit-IV Long Answer Questions--

1. Describe Parathyroid ultimobranchial glands and its regulatory mechanisms.
2. Describe Gastro-entero-pancreatic endocrine system
3. Describe Adrenal gland in vertebrates.
4. Describe male Gonadal hormones in vertebrates and feedback mechanisms.
5. Describe female Gonadal hormones in vertebrates and feedback mechanisms.

Short Answer Questions—write an account on --

1. Parathyroid glands
2. Ultimobranchial glands
3. Pancreas
4. Gastro endocrine system
5. Entero endocrine system
6. functions of Adrenal gland
7. male Gonadal hormones and its functions
8. female Gonadal hormones and its functions

9. Paper-VII - Molecular Biology and Biotechnology

Unit 1: Long answer questions (16marks)

1. Describe $Cot^{1/2}$ and $Rot^{1/2}$ values. Add a note on forms of DNA.
2. Describe different types of DNA damages. Add a note on the excision repair system of DNA.
3. Explain in details structure and function of Organelle genome.
4. Watson and Cricks model of DNA and add a note on various forms of DNA.
5. Molecular mechanism of Eukaryotic DNA replication

Unit 1 Write notes on (8 marks)

1. Types of DNA damage.
2. Transcription coupled repair.
3. Prokaryotic DNA replication
4. $Cot^{1/2}$ and $Rot^{1/2}$ values
5. Regulation of DNA replication in prokaryotes
6. Excision repair system

Unit 1 Short answer questions (4 marks)

1. Recombination repair
2. Forms of DNA
3. $Cot^{1/2}$ values
4. Double strand break repair
5. Base excision repair

Unit 2 Long answer questions (16marks)

1. Describe detailed account of mobile DNA elements.
2. Transcription in Eukaryotes. Add a note on RNA polymerase.
3. Post translational modification in Prokaryotes & Eukaryotes.
4. Transcription in Prokaryotes. Add a note on RNA polymerase.
5. Explain stages of translation in Prokaryotic cell.

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6. Define an Operon and describe in detail inducible operon with an example.

Unit 2 Write notes on (8 marks)

1. RNA polymerases
2. Positive and Negative control of operon
3. Retroviruses – structure and functions
4. Lac operon
5. Response element
6. Genetic code

Unit 2 Short answer questions (4 marks)

1. IS elements
2. Retroviruses
3. Transposable elements
4. Inducible elements.
5. Retrotansposons
6. RNA polymerase
7. Transcriptional factor

Unit 3 Long answer questions (16marks)

1. Describe detail account of Plasmids, cosmid, phagemids and YAC's
2. Explain in detail Antisense and Ribozyme technology and its applications in molecular biology
3. Cloning vector of recombinant DNA technology
4. Describe in detail hybridization technique and add a note on microarray
5. Northern hybridization

Unit 3 Write notes on (8 marks)

1. Sanger's dideoxy method of DNA sequencing
2. Si RNA and gene silencing
3. Microarray
4. Maxam –Gilbert method
5. Antisense technology
6. Mi-RNA

7. Gene silencing
8. RAPD

Unit 3 Short answer questions (4 marks)

1. Restriction enzymes
2. Cosmid
3. YAC'S
4. Plasmid
5. Gene amplification
6. PCR
7. Si-RNA

Unit 4 Long answer questions (16marks)

1. Give an account of role of microbes in production of fermentation product, enzymes, antibiotics and single cell proteins
2. Describe the applications of restriction fragment length polymorphism (RFLP) in medical biotechnology.
3. Write an account on hybridoma technology describe in detail Microbial fermentation products with reference to antibiotics
4. Give application of restriction restriction fragment length polymorphism (RFLP) in genetic counseling and forensic science.

Unit 4 Write notes on (8 marks)

1. Biofertilizers and Biogas
2. RFLP in forensic science
3. Monoclonal antibodies
4. Use of biosensors in industrial and environmental biotechnology
5. Hybridoma technology

Unit 4 Short answer questions (4 marks)

1. Single cell protein
2. Biogas
3. Antibiotics

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4. Microbial production of fermentation products
5. Enzymes
6. Biosensors

Paper-VIII - Advanced Developmental Biology

Unit 1.

Long answer questions : (16 marks)

1. Give an account of types structure and functions of foetal membranes in mammals .
2. Describe mechanism of implantation in mammals.
3. Write an account of types of placenta and their hormones
4. Explain hormonal control of metamorphosis in amphibians.
5. Describe morphogenetic and biochemical mechanism of metamorphosis in amphibians.
6. Write an account on placental hormones and their functions.

Short answer type/Short notes (8 marks)

1. Mechanism of Implantation
2. Types of Placenta
3. Hormones of placenta and their functions.
4. Morphogenic mechanism of Amphibian metamorphosis.
5. Process of implantation
6. Types of Fetal membranes
7. Functions of fetal membranes

Unit 1. Short answer question (4 Marks)

1. Amniotic fluid
2. Chorion
3. Allantois
4. Trophactoderm
5. Syncytiotrophoblast
6. Inner cell mass
7. Amnion
8. ACTH

Unit 2. Long answer questions : (16 marks)

1. Describe the process of ageing, its mechanism and concepts by giving suitable examples.
2. Describe different types of regeneration in vertebrates .
3. Explain the mechanism of apoptosis and its importance
4. Give an account of different models of ageing.
5. Give an account of mechanism of ageing.
6. Describe the polymorphism in honey bees.

Unit 2. Short answer type/Short notes (8 marks)

1. Regeneration of limb in vertebrate
2. Lense and retinal regeneration in vertebrates
3. Polymorphism in Ants.
4. Free radical theory of ageing
5. Wear and tear theory
6. Significance of apoptosis
7. Polymorphism in termites
8. Polymorphism in ants

Unit 2. Short answer question (4 Marks)

1. Oxidation
2. Free radicals
3. Antioxidants
4. Differentiation
5. Dedifferentiation
6. Redifferentiation
7. Drone bee
8. Worker bee
9. Queen bee

Unit 3 : Long answer questions : (16 marks)

1. Write an account on applications of embryonic stem cells and it's economic significance
2. Principle and application of MOET.
3. Describe methods for screening of genetic disorders
4. Describe process of cloning and its significance
5. Describe *In Vitro* fertilization and its extensions.

Unit 3. Short answer type/Short notes (8 marks)

1. Process of Cloning of animals by nuclear transfer
2. Multiple ovulation and embryo transfer (MOET)
3. Intra - cytoplasmic sperm injection (ICSI)
4. Embryo sexing technique
5. Applications of cloning of animals.
6. GIFT technique
7. Amniocentensis and chorionic villi sampling

Unit 3. Short answer question (4 Marks)

1. Totipotent
2. Pluripotent
3. Clomiphene citrate
4. Enucleation
5. Ultrasound monitoring
6. Fallopian tube
7. IVF

Unit 4: Long answer questions : (16 marks)

1. Describe various immunocontraceptives, their mode of functioning in women, advantages and disadvantages .

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2. Describe various contraceptive methods
3. Describe principle and application of production of transgenic animals
4. Importance of transgenesis

Unit 4. Short answer type/Short notes (8 marks)

1. Anti Androgen compound .
2. Role of mutants in human welfare
3. Chemical contraceptives
4. IUCD device
5. Important of mutants in research
6. immunocontraceptives

Unit 4. Short answer question (4 Marks)

1. Tubectomy
2. Vasectomy
3. Progesterone
4. Estrogen
5. Homologous recombination
6. Non homologous recombination
7. Copper T

For any queries, feel free to contact us on E-mail/ Whats App No.:

M.R.Chandrakar – mamatachandra@rediffmail.com

Whats App No – 9552322775

A.D.Theng – genica@rediffmail.com

Whats App No –9881388510

V.P.Khandwekar – vaibhavkhandwekar@gmail.com

Whats App No –9028408078

V.J.Sharma- vishikha_2007@yahoo.com

Whats App No –7058668691

S.P.Biswas- saikatbiswas1985@outlook.com

Whats App No –9420178560

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