

S. V. K. P. & Dr. K. S. RAJU ARTS & SCIENCE COLLEGE (AUTONOMOUS)

PENUGONDA-534320, W. G. Dist., A.P.

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(Affiliated to Adikavi Nannaya University)

M.Sc Zoology - I Semester

Model Question Paper: Paper - I

19ZOOT11 Tools and Techniques for Biology

Time: 3 hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) What is an assay? Explain different types of assays.
(OR)
b) Write the principle and types of microscopy and elaborate on dark field microscopy.
2. a) Describe the principle and applications of centrifuges with an emphasis on ultracentrifuge.
(OR)
b) Describe various types of chromatographic techniques to separate molecules.
3. a) Describe the principle and applications of spectrophotometer.
(OR)
b) What is autoradiography? Give an account on its biological applications.
4. a) Describe the process of inoculation and growth monitoring.
(OR)
b) Explain in detail about microbial assays.

Section-B

3X5=15

5. Answer any THREE of the following:

- a) pH meter.
- b) Biochemical mutants and their uses.
- c) TLC.
- d) Spectrofluorimetry.
- e) Density gradient centrifugation.
- f) Treatment of substrate surfaces.



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Model Question Paper: Paper - II

19ZOOT12 Biosystematics, Biodiversity & Evolution

Time: 3 hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) Define Biosystematics. Explain in detail the importance and applications of Biosystematics
(OR)
b) Discuss about the different taxonomic procedures.
2. a) Discuss in detail about the origin of basic biological molecules.
(OR)
b) Explain about the evolution of eukaryotic genome
3. a) What is the three domain concept of living kingdom. Discuss
(OR)
b) What is Speciation. Explain the mechanism involved in speciation.
4. a) Discuss in detail about the theories of Organic Evolution.
(OR)
b) What is Hardy Weinberg Law. Discuss.

Section-B

3X5=15

5. Answer any THREE of the following:

- a) Chemotaxonomy.
- b) ICZN.
- c) Molecular Clocks.
- d) Eras.
- e) Subspecies.
- f) Hierarchy of categories.



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M.Sc Zoology - I Semester
Model Question Paper: Paper - III
19ZOOT13 Biomolecules

Time: 3hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) Describe the structure, classification and properties of amino acids.
(OR)
b) Explain about structural characterization of proteins.
2. a) Write about the classification, structure, properties and functions of monosaccharides.
(OR)
b) Explain about polysaccharides and their occurrence in nature.
3. a) Discuss about the classification, structures, properties and biological functions of fatty acids.
(OR)
b) Explain about phospholipids, sphingolipids, prostaglandins, and steroids with their biological role.
4. a) Explain about the structure, types and physicochemical properties of Nucleic acids.
(OR)
b) Write in detail about RNA and its functions.

Section-B

3X5=15

5. Answer any THREE of the following:

- a) Peptide bond.
- b) Glycoproteins.
- c) fatty acids.
- d) Chitin.
- e) Ramachandran plot.
- f) Leukotrienes.



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M.Sc Zoology - I Semester

Model Question Paper: Paper - IV

19ZOOT14 Molecular Cell Biology

Time: 3 hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) Describe in detail about the transport across the cell membrane.
(OR)
b) Explain the transport of macromolecules across the epithelial layer.
2. a) Explain the role of cytoskeletal elements in defining the structure of a cell.
(OR)
b) Enumerate the role of cytoskeletal elements in mitosis.
3. a) Write in detail about cell adhesion and communication mechanisms.
(OR)
b) Elaborate on the second messenger system in cell signaling.
4. a) Cyclins and cyclin dependent kinases regulate cell cycle, Justify.
(OR)
b) Describe various post-translational mechanisms in protein synthesis.

Section-B

3X5=15

5. Answer any THREE of the following
 - a) Membrane potential.
 - b) Cilia and flagella.
 - c) Integrins and collagen.
 - d) Chromosomal organization of genes.
 - e) Mobile DNA.
 - f) Symporters and antiports.



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M.Sc Zoology - II Semester
Model Question Paper: Paper - I
19ZOOT21 Biostatistics and Bio-informatics

Time: 3 hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) What is Sampling. Discuss
(OR)
b) Discuss in detail about the Measures of Central tendency.
2. a) Explain in detail about the bivariate analysis.
(OR)
b) What is test of significance. Discuss in detail.
3. a) Describe about the Basic components of the Computer.
(OR)
b) Explain the use of MS excel in for data presentation.
4. a) What are biological databases? Explain.
(OR)
b. Discuss in detail about sequence alignments.

Section-B

3X5=15

5. Answer any THREE of the following

- a) Frequency distribution.
- b) Chisquare test.
- c) MS word.
- d) Power point.
- e) Genomics.
- f) Phylogenetic analysis.



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M.Sc Zoology - II Semester

Model Question Paper: Paper - II

19ZOOT22 Animal Physiology

Time: 3 hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) Write briefly molecular structure and properties of muscle, Add note on sliding filament theory.
(OR)
b) Write about haemopoiesis, Haemoglobin, and haemostasis. Add note on factors affecting blood coagulation.
2. a) Write about osmoregulation in aquatic Environments.
(OR)
b) Write about response to biotic and abiotic factors.
3. a) Write about the comparative physiology of excretion, Urine formation, Urine concentration, and waste elimination.
(OR)
b) Write about comparative anatomy of heart structure, myogenic heart. Add a note on blood pressure.
4. a) Write about photoreceptors, Auditory, Mechanoreceptors.
(OR)
b) Explain fresh water and terrestrial environment.

Section-B

3X5=15

5. Answer any THREE of the following:

- a) Synaptic transmission & Neurotransmitters.
- b) Neural control of muscle tone and posture.
- c) Chemoreceptor.
- d) Acclimatization.
- e) BMR.
- f) ECG.




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M.Sc Zoology - II Semester

Model Question Paper: Paper - III

19ZOOT23 Immunology

Time: 3 hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) What is innate immunity? Describe various innate immune mechanisms.
(OR)
b) Describe the structure and functions of various types of immunoglobulins.
2. a) Write an essay on antigen-antibody interactions.
(OR)
b) What are the cells involved in immune response? Describe their role.
3. a) Elucidate the mechanisms of antibody response to antigens.
(OR)
b) Write about Classical and alternative activation of complement.
4. a) What is immune tolerance? Elucidate the mechanisms of tolerance in T and B cells.
(OR)
b) Write an essay on immunological tests used in molecular and diagnostic laboratories.

Section-B

3X5=15

5. Answer any FIVE of the following:

- a) Acquired immunity.
- b) Haptens.
- c) Antigen presenting cells.
- d) Cytotoxic T-cells.
- e) Antigen receptors.
- f) ELISA.




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M.Sc Zoology - II Semester
Model Question Paper: Paper - IV
19ZOOT24 Molecular Biology

Time: 3hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) Explain the prokaryotic and eukaryotic DNA replication.
(OR)
b) Explain the mechanics of DNA replication.
2. a) Explain the post transcription in prokaryote and eukaryotic transcription.
(OR)
b) Explain the post transcriptional modifications in RNA.
3. a) Explain the mechanisms of prokaryotic and eukaryotic translation.
(OR)
b) Explain the molecular mechanism of the antisense molecules and add a note on inhibition of splicing.
4. a) Write about gene targeting and DNA repair.
(OR)
b) Explain the types of mapping and molecular mapping of genome.

Section-B

3X5=15

5. Answer any FIVE of the following:
 - a) Enzymes involved in DNA replication.
 - b) RNA polymerases.
 - c) FISH.
 - d) Necessary proteins involved in DNA replication.
 - e) Genetic map.
 - f) Cap formation in post-translational modifications.




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M.Sc Zoology - III Semester
Model Question Paper: Paper - I
19ZOOT31 Applied Zoology

Time: 3 hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) What are fermenters? Write about principle and types of fermenters.
(OR)
b) Explain in detail about the industrial production of penicillin and riboflavin.
2. a) Describe about structure of live-stock breeding in poultry.
(OR)
b) Explain artificial insemination technique.
3. a) Elucidate on breeding of animals through artificial insemination.
(OR)
b) Describe the production of transgenic animals and their applications in health and disease.
4. a) Explain the mechanism of recovery of metals and acid mines from drainage using bioresources.
(OR)
b) Discuss in detail on the need and usage of biopesticides in agricultural production.

Section-B

3X5=15

5. Answer any THREE of the following.

- a) Germplasm bank.
- b) Molecular cloning.
- c) Bioremediation.
- d) Recombinant vector antigens.
- e) Somatic cell nuclear transfer.
- f) Marker-assisted technology.



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M.Sc Zoology - III Semester
Model Question Paper: Paper - II
19ZOOT32 Developmental Biology

Time: 3hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) Describe in detail about the process of fertilization.
(OR)
b) Write an account on molecular mechanism of cleavage and cleavage patterns.
2. a) Give a detailed account on chick gastrulation.
(OR)
b) What is neurulation .Explain the process of neurulation with an example.
3. a) Explain the mechanism of cellular differentiation of ectoderm into CNS & Epidermis.
(OR)
b) How does cell to cell communication help in organ formation during development?
4. a) How does differential gene expression occurs during animal development.
(OR)
b) Write about selective nuclear RNA processing and mRNA translation.

Section-B

3X5=15

5. Answer any THREE of the following:

- a) Blocking of polyspermy.
- b) Regulative development.
- c) Endoderm derivatives.
- d) Structure of sperm.
- e) Autonomous development.
- f)Regeneration of organs.



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M.Sc Zoology - III Semester
Model Question Paper: Paper – III
19ZOOT33 Principles of ecology

Time: 3 hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) Write in detail about the abiotic component of the ecosystem.
(OR)
b) Explain the Concept of Primary Productivity.
2. a) Discuss about the Population growth.
(OR)
b) Explain about the different types of species interactions.
3. a) What is an Ecological Community. Explain in detail about the structure and form of the Community.
(OR)
b) Discuss about the biogeographic realms of the world.
4. a) Discuss in detail about the major drivers responsible for environmental stress.
(OR)
b) What is biodiversity conservation? Discuss.

Section-B

3X5=15

5. Answer any THREE of the following:

- a) Food chain.
- b) Ecological Pyramids.
- c) Metapopulation.
- d) Ecological Succession.
- e) Hotspots.
- f) IUCN.



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M.Sc Zoology - III Semester

Model Question Paper: Paper – IV

19ZOOT34 Metabolic Cell Function & Regulation

Time: 3hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) Describe the thermodynamic principles suitable for living organisms.
(OR)
b) Write notes on degradation of glucose.
2. a) Explain the electron transport chain in mitochondria.
(OR)
b) Explain the biosynthesis of prostaglandins.
3. a) Write an account on classification and nomenclature of enzymes.
(OR)
b) Discuss on the metabolic profile of neural tissue.
4. a) Explain the process of immobilization of enzymes.
(OR)
b) What is metabolic engineering? Elaborate.

Section-B

3X5=15

5. Answer any THREE of the following:
 - a) Methods to study metabolism.
 - b) Oxidative phosphorylation.
 - c) Kinetic analysis of enzymes.
 - d) Metabolic profile of adipose.
 - e) Degradation of palmitic acid.
 - f) Storage of biological energy.



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M.Sc Zoology - IV Semester

Model Question Paper: Paper – I

19ZOOT41 Neurobiology & Animal Behaviour

Time: 3hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) Describe in detail the flow of information in neurons.
(OR)
b) Derive Nernst equation.
2. a) What is Action potential. Explain the propagation of action potential across the neuron.
(OR)
b) Discuss the types of channels involved in signaling.
3. a) Write an account on Catecholamine synthesis, release and uptake.
(OR)
b) Write an account on organization of the brain.
4. a) Discuss the behavior in insects with examples.
(OR)
b) What are cognitive skills. Explain different types of learning with examples.

Section-B

3X5=15

5. Answer any THREE of the following:

- a) Neuroglial cell interaction.
- b) Metabotropic receptors.
- c) Cerebellum.
- d) Imprinting.
- e) Structure of neuron.
- f) Sodium channel.



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M.Sc Zoology - IV Semester

Model Question Paper: Paper – II

19ZOOT42 Animal Cell Culture & Stem Cell Technology

Max. Marks: 75

Time: 3 hours

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) Discuss the Scope and Importance of biotechnology.
(OR)
b) Explain Recombinant DNA and gene cloning technology.
2. a) Write about polymerase chain reaction.
(OR)
b) Discuss the application of PCR in biotechnology and genetic engineering.
3. a) Explain the laboratory facilities of culture media in animal cell and tissue culture.
(OR)
b) Discuss biotechnology in Medicine.
4. a) Explain pollution control of environment and energy conservation.
(OR)
b) Explain in detail IPR and IPP.

Section-B

3X5=15

5. Answer any THREE of the following:
 - a) Gene libraries.
 - b) Basic PCR and its modifications.
 - c) Cell lines.
 - d) Organ culture.
 - e) Biotechnology and biodiversity.
 - f) Genetic counseling.



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Model Question Paper: Paper – III

19ZOOT43 Aquaculture

Time: 3hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) Explain the criteria involved for the construction of fish farms.
(OR)
b) Write about the preparation and management of different types of ponds in fish farms.
2. a) What are the different fish seed resources? Add a note on their transportation.
(OR)
b) Discuss about carp culture.
3. a) Discuss about fish nutrition.
(OR)
b) Explain crab culture.
4. a) Discuss about the shrimp hatchery construction and its management.
(OR)
b) Explain the water quality management in brackish water farms.

Section-B

3X5=15

5. Answer any THREE of the following:
 - a) Biological criteria for selection of aquaculture species.
 - b) Integrated fish farming.
 - c) Milk fish culture.
 - d) Feed management.
 - e) Pearl oyster culture.
 - f) Cage culture and pen culture.



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M.Sc Zoology - IV Semester

Model Question Paper: Paper – IV

19ZOOT44 Animal Biotechnology & Bio-ethics

Time: 3hours

Max. Marks: 75

Answer ALL questions. All questions carry equal marks

Section-A

4X15=60

1. a) Write about the tools used in rDNA technology with examples.
(OR)
b) Describe different types of vectors used for cloning in mammalian cells.
2. a) What is gene transfer? Write the mechanism of gene delivery systems.
(OR)
b) What is hybridization? Explain the design and preparation of probes used for hybridization.
3. a) Enumerate the methods of DNA sequencing and add a note on next generation sequencing.
(OR)
b) Discuss the role of DNA finger printing in forensic science.
4. a) Define bioethics. Discuss the need to follow the policies and laws in scientific field.
(OR)
b) Write an account on good laboratory practices.

Section-B

3X5=15

5. Answer any FIVE of the following:

- a) Mechanical shearing.
- b) cDNA library.
- c) Automated DNA sequencing.
- d) Un-ethical acts.
- e) Ti plasmid.
- f) Northern blotting.



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