M.Sc. (Previous) Zoology, Examination 2015
Model Paper A
Paper V (Biochemistry)

Time Allowed: 3 Hours Max. Marks: 100

All questions are compulsory :-

1. Answer briefly

1) What is motif?
2) Write the names of molecules which play role as a secondary messenger in signal transduction.
3) What is chaperon?
4) What is the difference between secondary and tertiary structure of protein?
5) Which methods are used for DNA sequencing?
6) What is the function of Riboflavin?
7) Write the subunits of RNA polymerase.
8) What is ß-pleated sheet?
9) What is the role of myoglobin?
10) Define allostery.
11) Write two functions of lipids in biological system.
12) Draw the structure of cholesterol.
13) Draw the clover leaf structure of *t*-RNA.
14) Write the name of hydroxyl group containing amino acid.
15) Which DNA form is more favoured in biological system?
16) What is protein sequencing?
17) Differentiate Nucleotides and Nucleosides.
18) Define ribozymes.
19) What are alkaloids?
20) What is Methaemoglobin?

2. Write short notes on:

a) Write the structure and chemistry of any four amino acids.
b) Peptide bond.
c) Write short detail of any two secondary structures with structure.
d) Covalent modifications.

Or

a) Ramachandran plot.
b) Chaperon assisted protein folding.
c) Protein folding.
d) Fibrous proteins.

3. Write short notes on:

a) Myoglobin
b) Hill coefficient
c) Glycolipid
d) Phospholipid

Or

a) Vitamin B1
b) Write the properties and function of Alkaloids.
c) Difference between A,B and Z DNA.

d) Sickle cell anemia.

4. Write the detail account on fat soluble vitamins.

Or

Give in detail DNA sequencing method.

5. Give a detail account on inborn error of metabolism.

Or

What are sterols? Explain in detail with structure, properties and functions.

M.Sc. (Previous) Zoology, Examination 2015
Model Paper B
Paper V (Biochemistry)

Time Allowed: 3 Hours Max. Marks: 100

All questions are compulsory :-

1. ***Answer briefly***
   1) What is α-helix.
   2) What are essential amino acids?
   3) Write characteristics of glycolipids.
   4) Enumerate the functions of Vitamin A.
   5) Write the main features of globular proteins.
   6) Write the role of folic acid.
   7) Which factors affect enzyme action?
   8) Write the significance of Vitamin K in blood clotting.
   9) What are steroids?
   10) Distinguish between fibrous and globular proteins.
   11) Draw the structure of any one nucleotide.
   12) Write Michaelis-Menten Equation.
   13) What are vitamins?
   14) What is DNA hybridization?
   15) What is polymerase?
   16) Draw the structure of ATP molecule.
   17) Write the full form of MUFA and PUFA.
   18) Name two methods of protein sequencing.
   19) Draw the structure of any two amino acids.
   20) Draw the structure of two pyrimidines.

2. Write short notes on:

   a) Hemoglobin
   b) Amino acids
   c) Protein splicing
   d) Ramachandran plot

   Or

   a) Hemoglobinopathies
   b) Signal transducing molecules
   c) Derived lipids
   d) Vitamin B12

3. Write short notes on:

   a) Vitamin E
   b) Ribofalvin
   c) Inborn errors of protein metabolism
   d) Tertiary structure of proteins

   Or

   a) Modified nucleosides
   b) Tertiary structure of polynucleotides
   c) Ribozymes
   d) Coenzymes

4. Explain enzyme kinetics. Also add a note on polymerases.

Or

Explain the structure, function and properties of alkaloids and phenolics.

5. Explain the oxygen binding property of hemoglobin. Also explain hemoglobin allostery.

Or

Describe the nomenclature, structure and properties of fatty acids.

M.Sc. (Final) Zoology, Examination 2015
Model Paper A
Paper III (Genes And Differentiation)

Time Allowed: 3 Hours Max. Marks: 100

All questions are compulsory :-

1. ***Answer briefly***
   1) Define regulative development.
   2) Define determinate cleavage.
   3) How does spiral cleavage occur?
   4) What is ecdysone?
   5) What is the function of sertoli cells?
   6) Define Potency.
   7) What is the Syncytial specification?
   8) Differentiate between Isolecitual and Telolecithal eggs.
   9) Differentiate between Hemimetabolous and Homometabolous.
   10) Differentiate between Autonomous and Conditional specification.
   11) What are testis determining genes?
   12) What is apoptosis?
   13) What are pair of rule genes?
   14) Distinguish between segment and parasegment.
   15) Differentiate between Totipotency and Pleuripotency.
   16) What are segment polarity genes?
   17) What do you understand by temperature related sex determination?
   18) What is competence?
   19) Define neuralation.
   20) List types of unequal cleavages.

2. Write short notes on:

   a) Describe cell commitment and differentiation.
   b) What are embryomic stem cells? Explain.
   c) Comment on the role of germ cell migrations with the help of diagram.
   d) Explain cleavage planes.

Or

   a) Briefly explain environmental sex determination.
   b) How is anterior-posterior axis determined in *Drosophila*.
   c) Explain development in Acetabularia.
   d) Explain gastrulation.

3. Write short notes on:

   a) Comment upon stem cell disorders.
   b) What are gap genes, pair rule genes and segment polarity genes?
   c) Explain gene therapy.
   d) Explain neurulation.

Or

a) Explain cleavage patterns.
b) Explain any five types of gastrular movements.
c) Explain Wnt pathway.
d) How the development of autopod does occur?

4. Explain in detail tetrapod limb development.

Or

What are the types of cleavage? Explain.

5. Describe development of ovary and mammary gland differentiation.

Or

Explain stem cells and bone marrow transplant.

M.Sc. (Final) Zoology, Examination 2015
Model Paper B
Paper III (Genes And Differentiation)

Time Allowed: 3 Hours Max. Marks: 100

All questions are compulsory :-

1. ***Answer briefly:***
   1) Define mosaic development.
   2) Define cleavage.
   3) Write the full form of PTTH.
   4) What are stem cells?
   5) What is bone marrow transplant?
   6) Name the two types of gene therapy.
   7) Define autonomous specification.
   8) Name the ovary determining genes.
   9) Name two hormones produced by testis.
   10) What is the site of juvenile hormone production in insects?
   11) Define holometabolous metamorphosis.
   12) Give two features of tadpole larva.
   13) Define ingression.
   14) What are developmental constrains?
   15) What are maternal genes?
   16) Name the pathways of FGF and Hedgehog family.
   17) What are planes of cleavage?
   18) At which somite number the forelimb and hindlimb develop?
   19) Differentiate between protostomes and deuterostomes.
   20) Name any two secondary pair rule genes.

2. Write short notes on:

   a) Explain the types of cell specification.
   b) What are the properties of stem cell? Explain.
   c) Explain axis specification in mammals.
   d) What is gastrulation? Explain its types.

   Or

   a) Draw a chart showing development in metazoans.
   b) Explain proximal-distal axis specification in tetrapods.
   c) Write a note on xenopus blastomere.
   d) What are developmental constrains? Explain.

3. Write short notes on:

   a) Explain Hedgehog pathway.
   b) What are the structural and biochemical changes which occur during metamorphosis of frog?
   c) Explain cell-cell interactions.
   d) What are environmental cues? Explain.

   Or

   a) Write a note on hematopioesis.
   b) Write a note on bone marrow transplant.
   c) How does skeletal muscle regeneration occur?
   d) What is the role of testosterone in secondary sex determination?

4. Explain cell specification in nematodes.

Or

Explain primary sex determination in mammals.

5. Explain germ cell migration in birds and mammals.

Or

Explain metamorphosis in insects.

M.Sc. (Final) Zoology, Examination 2015

Model Paper A

Paper VI (Ecotoxicology, Environmental Microbiology and Biotechnology)

Time Allowed: 3 Hours Max. Marks: 100

All questions are compulsory :-

1. ***Answer briefly:***
   1) What is acute animal testing?
   2) Name any two bacteria involved in nitrogen fixation.
   3) What is teratology?
   4) Name any two harmful pesticides.
   5) Name any two diseases caused by Arsenic toxicity.
   6) Which gases contribute to greenhouse effect?
   7) Define biomagnifications.
   8) What is eutrophication?
   9) What is primary treatment of liquid wastes?
   10) Define composting.
   11) Mention three basic approaches to control biodeterioration.
   12) Which toxin is present in *Bacillus thuringiensis*?
   13) What is full form of PVC?
   14) What is full form of DDT?
   15) What is acid mine drainage?
   16) Name the devices used for air emission control.
   17) Draw the structure of pentachlorophenol.
   18) Define biohydrometallurgy.
   19) Define carcinogenesis.
   20) Give any four sources of air pollution.

2. Write short notes on:

   a) Acute, chronic and sub-chronic animal testing.
   b) Bioremediation of marine oil pollutants.
   c) Ozone depletion.
   d) Synthetic polymers.

   Or

   a) Nitrogen cycle in nature.
   b) Physical and chemical teratogens.
   c) Global warming.
   d) Frost protection.

3. Write short notes on:

   a) Biological Oxygen Demand.
   b) Phosphorus cycle.
   c) Production of fuels by methane.
   d) Single cell protein production.

   Or

   a) Bt pesticides.
   b) Bioremediation of air pollutants.
   c) Sulfur cycle.
   d) Types of composting.

4. Explain in detail liquid waste treatment.

Or

What is air pollution? Explain its sources, effect and prevention in detail.

5. What is bioremediation? Explain its types.

Or

Explain aerobic and anaerobic degradation of chlorobenzenes and tetrachloroethane.