

Total No. of Questions : 8]

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P713

[3924] - 101

M.Sc. - I (Semester - I)

ZOOLOGY

ZY - 101 : Biochemistry (2005 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any four questions.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw diagrams wherever necessary.*

- Q1)** a) Derive Line-waver burk equation. Give its importance in enzyme inhibition analysis. [8]
- b) Give the following reactions in detail. [12]
- i) Fructose - 1- 6 - biphosphate → Fructose - 6 - Phosphate.
 - ii) Glycerate - 3 - Phosphate → Glycerate 1, 3 - biphosphate.
 - iii) Fructose - 6 - Phosphate → Glucose - 6 - Phosphate.
- Q2)** a) Discuss the chemiosmotic theory for Phosphorylation. [10]
- b) Describe the process of pentose Phosphate pathway. [10]
- Q3)** a) Give the role and importance of co-enzyme. Give the structure of the co-enzyme of vit. B₂. [10]
- b) Give the various levels of protein structure and mention the importance of various forces involved in stability. [10]
- Q4)** Write notes on : [20]
- a) Enzymes in RDT.
 - b) Uncouplers.
 - c) Phospholipids.
 - d) Structural Polysaccharide.
- Q5)** a) What is inhibition? Give the types of reversible inhibition with suitable example. [10]
- b) Describe in detail Inosinic pathway. [10]

[P.T.O.

Q6) a) Describe the process of oxidation of unsaturated fatty acid. [10]

b) Describe the structure of glutamate dehydrogenase complex. [10]

Q7) Discuss in detail the process of glycolysis. Give its regulation at different levels. [20]

Q8) Write notes on : [20]

a) Deamination of Serine.

b) Synthesis of deoxyribonucleotide.

c) C - Terminal determination.

d) Ammonia detoxification.

□□□

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[3924] - 102

M.Sc. (Semester - I)

ZOOLOGY (2005 Pattern)

ZY - 102 : A) Genetics

B) English for Scientists

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answers to the two sections should be written in separate answer books.
- 2) Attempt any two questions from each section.
- 3) All questions carry equal marks.
- 4) Use of calculator is allowed.

SECTION - I

(A) Genetics

Q1) Explain the types of operons. How does it ensure the 'induction' and 'repression' mechanism of operons? Explain the control mechanisms of operon with suitable example.

Q2) a) Phenylketonuria is due to an autosomal recessive gene. If the frequency of an affected individuals in the population is 1/100; what is the probability that the unrelated normal parents produce a PKU child?

b) In a test cross between a heterozygous F_1 . Drosophila female +++/cv v ct with $\frac{cv}{+} \frac{v}{+} \frac{ct}{+}$ male for three recessive genes [Crossveinless (cv), cut wings (ct), vermilion eye (v)], the F_2 progeny results were :

+	+	+	:	300	+	v	+	=	130
cv	v	ct	:	200	cv	+	ct	=	100
+	v	ct	:	60	+	+	ct	=	70
cv	+	+	:	110	cv	v	+	=	30

How can you map the three genes?

Q3) Discuss the role of HAT medium in the selection of hybrid cells in somatic cell hybridization technique. Explain the applications of this technique.

P.T.O.

Q4) Write notes on any two of the following :

- a) Genetic basis of inheritance of quantitative trait.
- b) Restriction enzymes in r-DNA technology.
- c) Microarray analysis.

SECTION - II

(B) English for Scientists

Q5) a) Explain in detail the style of writing “Introduction” section of a scientific paper. What justification should be given in the introduction part?

- b) Explain how to cite references in the text of a research paper using different reference styles.

Q6) a) What are the objectives of a project work?

- b) What is scientific paper and why scientists must write?

Q7) a) Explain how to write ‘Materials and Methods’ section? Explain the importance of measurements.

- b) Explain the importance of graphs and tables in a scientific paper.

Q8) a) State any five jorgans with its appropriate substitutions/preferred usage.

- b) Explain the significance of abstract and keywords.



P716

[3924] - 201
M.Sc. (Sem. - II)
ZOOLOGY
ZY- 201 : A) Developmental Biology
B) Comparative Animal Physiology
(2005 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates :

- 1) Answers to the two sections should be written in separate answer books.*
- 2) Attempt any two questions from each section.*
- 3) All questions carry equal marks.*
- 4) Draw neat labelled diagrams wherever necessary.*

SECTION - I

A) Developmental Biology

- Q1)* Describe the changes that occur in the sperm head during acrosome reaction and comment on the molecular strategy to ensure monospermy.
- Q2)* Explain in detail the process of mesoderm induction in *Xenopus*.
- Q3)* What is cellular ageing? Discuss with reference to Hayflick's experiment on fibroblasts.
- Q4)* Write notes on any two of the following :
- a) Fate maps in chick embryo.
 - b) Lampbrush chromosomes.
 - c) Tail fibre complex.
 - d) Lens development.

P.T.O.

SECTION - II

B) Comparative Animal Physiology

Q5) Explain the ultra structure of skeletal muscle. Add a note on mechanism of muscle contraction and role of calcium ions in contraction.

Q6) Explain the mechanism of osmoregulation in marine animals.

Q7) a) What are sense organs? Add a note on Photoreception.

b) Explain the process of urine formation.

Q8) Write short notes on (any four) :

a) Neurohaemal organs.

b) Ascorbic acid synthesis.

c) Excretion of ammonia.

d) Oxygen dissociation curve.

e) Cardiac output.



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[3924]-103

M.Sc. (Sem. - I)

ZOOLOGY (2005 Pattern)

Zy - 103 : A) Freshwater Zoology

B) Statistical Methods

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate answer book.*
- 2) *Answer any two questions from each section.*
- 3) *Figures to the right indicate full marks.*
- 4) *Draw neat labelled diagrams wherever necessary.*

SECTION - I

A) Freshwater Zoology

- Q1)** Give an account of general features of Lentic biome. **[20]**
- Q2)** Describe aquatic adaptations exhibited by the hexapod larvae and Nymphs. **[20]**
- Q3)** Describe various aquatic habitats and comment on the changes in these due to man's activities. **[20]**
- Q4)** Write notes on any four : **[20]**
- a) Chemical properties of water.
 - b) Freshwater arthropods.
 - c) Dytiscus beetle.
 - d) Algal Bloom.
 - e) Ephemeral water bodies.

SECTION - II

B) Statistical Methods

- Q5)** a) Define the following terms : **[6]**
- i) Class-limits.
 - ii) Class-width.
 - iii) Class-mark.

P.T.O.

b) The following data gives systolic blood pressure in mm. before exercise for 12 men. 116, 130, 110, 114, 126, 118, 112, 116, 120, 132, 140, 142. Find the mean; median and standard-deviation of above data. [10]

c) Define regression coefficients and state its properties. [4]

Q6) a) State the properties of normal distribution. [6]

b) The following data gives the age in years and blood pressure in mm. of 6 men.

Age (X): 36 47 56 42 49 72

B.P. (Y): 118 128 147 125 145 160

Fit a regression equation of Y on X and estimate B.P. of a man whose age is 50 years. [10]

c) In a family there are three children. Assuming that male and female births are equally likely. Find the probability that there is atleast two boys in the family. [4]

Q7) a) Explain the test procedure for testing two population proportions. [10]

b) Among 64 offsprings of a certain cross between guinea pigs 34 were red; 10 were black and 20 were white. According to the genetics model these numbers should be in the ratio 9:3:4. Are the data consistent with the model at 5% L.O.S? [10]

Q8) a) Explain the test procedure for testing the population mean. [10]

b) PB concentration in soil samples is given below : [10]

1.3; 1.8; 1.6; 2.1; 3.8; 5.9; 4.7; 2.5; 3.4; 6.1.

Compute quartile deviation.



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[3924]-202

M.Sc.

ZOOLOGY

ZY - 202 : A) Molecular Biology

B) Cell Biology

(2005 Pattern) (Sem. - II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answer any two questions from each section.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

A) Molecular Biology

- Q1)** Discuss the role of various factors in protein synthesis. Give the mechanism of elongation process of prokaryotic translation and add a note on inhibitor's of protein synthesis. **[20]**
- Q2)** Explain in detail the structure of chromatin. Discuss formation of 10nm and 30nm fiber in higher order organization. **[20]**
- Q3)** a) What is capping? Discuss the process and importance capping. **[10]**
b) What is TBP? Give its role along with other transcription factor involved in eukaryotic transcription by RNA polymerase II. **[10]**
- Q4)** a) Explain the following : **[15]**
i) Z DNA.
ii) Reverse transcriptase.
iii) Poly (A) Tail.
iv) Inverted repeats.
v) Phylogenetic analysis.
- b) Explain nucleosome complex formation. **[5]**

P.T.O.

SECTION - II

B) Cell Biology

- Q5)** Explain the structure of plasma membrane and add a note on active transport. **[20]**
- Q6)** What is cell engineering? Explain the principle and application of cell fusion and cell microinjection. **[20]**
- Q7)** a) Explain the structure of nuclear pore complex and comment on its functions. **[10]**
b) Explain the structure and molecular organization of flagellum. **[10]**
- Q8)** Write notes on : **[20]**
- a) Protein import in mitochondria.
 - b) Cyclins.
 - c) Peroxisomes.
 - d) Ribosomes.



Total No. of Questions : 12]

[Total No. of Pages : 2

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[3924]-203

M.Sc.

ZOOLOGY

Zy - 203 : A) Biochemical Techniques

OR

A) Ichthyology

B) Endocrinology

(2005 Pattern) (Sem. - II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answer any two questions from each section.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

A) Biochemical Techniques

Q1) Answer the following : **[20]**

- a) What is bed volume? Explain the term packing of column.
- b) What is zone electrophoresis? How it differs from moving boundary electrophoresis?
- c) Define sedimentation coefficient. Give its determination and importance.
- d) Explain the term chromophore. Give its significance in absorption spectroscopy.

Q2) a) Give principle, various support and application of gel chromatography. **[10]**

b) Give principle, working and application of ultra centrifuge. **[10]**

Q3) a) What is sequencing? Discuss the methods of protein sequencing. **[10]**

b) Explain the construction, working and application of UV-visible spectrophotometer. **[10]**

Q4) Write short notes (any four) : **[20]**

- a) Radio Isotopes.
- b) Warburg's apparatus.
- c) HPLC.
- d) Choice of ionexchanger.
- e) Partition chromatography.

P.T.O.

OR

A) Ichthyology

- Q5)** Give classification of cyclostomata and chondrichthyes with diagnostic characters. [20]
- Q6)** Describe the various types of endocrine organs and their functions in fishes. [20]
- Q7)** Describe the anatomical modifications of digestive system in fishes. Give an account of food and feeding habit of fishes. Add a note on physiology of digestion. [20]
- Q8)** Write notes on any two of the following : [20]
- a) Lateral line system.
 - b) Anadromous migration.
 - c) Webberian ossicle.
 - d) Scales in fishes.

SECTION - II

B) Endocrinology

- Q9)** Explain the mechanism of salt and water balance in Crustaceans. [20]
- Q10)** a) Explain the role of hormones in Calcium metabolism. [10]
b) Explain the role of pituitary and pineal hormones in control of chromatophores. [10]
- Q11)** a) What is the role of hormones in regulation of lipid metabolism? [10]
b) Explain the mechanism of hormone action. [10]
- Q12)** Write notes on : [20]
- a) ACTH.
 - b) Role of ADH in osmoregulation.
 - c) Hormone receptors.
 - d) Hormones as chemical messengers.



P719

[3924]-301
M.Sc. - II (Sem. - III)
ZOOLOGY
ZY - 311 : Entomology - I
(2005 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any four questions.*
- 2) *Draw neat diagrams wherever necessary.*
- 3) *All questions carry equal marks.*

- Q1)** Trace the origin and evolution of class-Insecta.
- Q2)** Describe the structure of a typical leg and add a note on its modification in insects.
- Q3)** Write the taxonomical characters of following insect orders with suitable examples (any four) :
- a) Collembola.
 - b) Neuroptera.
 - c) Coleoptera.
 - d) Diptera.
 - e) Dictyoptera.
- Q4)** Describe the segmentation of abdomen of generalised insect. Add a note on abdominal appendages.
- Q5)** Give an account of structure and function of major organs of elimination met with in insects.
- Q6)** Describe the structure of female reproductive system of a typical insect. Add a note on types of ovarioles.
- Q7)** Write structure and function of exocrine glands in insects.
- Q8)** Write short notes on (any four) :
- a) Structure of midgut.
 - b) Haemocytes.
 - c) Tentorium.
 - d) Types of antennae.
 - e) Carpora cardiaca and carpora alata.



Total No. of Questions : 8]

[Total No. of Pages : 1

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[3924]-301

M.Sc. - II (Sem. - III)

ZOOLOGY

ZY - 312 : Genetics - I

(2005 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any four questions.*
- 2) *All questions carry equal marks.*
- 3) *Use of calculator is allowed.*

- Q1)** What are the advantages of using proteins and nucleic acids to determine phylogenies?
- Q2)** “The fraction of alleles that mates share by virtue of common ancestry is two times the inbreeding coefficient of their progeny”. Justify.
- Q3)** Explain the genetic consequences of the following :
- a) Inbreeding.
 - b) Assortative mating.
 - c) Genetic load.
 - d) Genetic death.
- Q4)** Write notes on the following techniques :
- a) FISH.
 - b) Flow sorting.
 - c) RFLP.
 - d) RT-PCR.
- Q5)** Give an account of recent progress in gene therapy. Describe any two examples of gene delivery systems.
- Q6)** Explain the three modes of selection - Directional, Distructive and stabilizing and their effects with suitable examples.
- Q7)** Explain the concept of phenotypic variance and its partitioning in different subcomponents.
- Q8)** Explain the concept of continuous variation. How does metric traits differ from non-metric traits. Give examples.



Total No. of Questions : 8]

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[3924]-301

M.Sc. - II (Sem. - III)

ZOOLOGY

ZY - 313 : Physiology - I

(2005 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any four questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat diagrams wherever necessary.*

Q1) Explain the problems of diving and strategies to reduce them.

Q2) a) Explain Du Bios temperature balance.
b) Explain the properties of action potential. Add a note on sodium-potassium pump.

Q3) Explain water balance in invertebrates. Describe methods to gain and lose water.

Q4) a) Explain the importance of antifreeze substances in fish.
b) Explain the mechanism of uric acid excretion.

Q5) a) Describe different types of gas floats with examples.
b) Explain the methods of determining metabolic rate.

Q6) a) Explain the structure and function of electroreceptors.
b) Write notes on :
i) Biochemical mechanism of bioluminescence in fire fly.
ii) Biological clock.

Q7) Write notes on :
a) Acclematization and acclimation.
b) Brown fat.
c) Dynamics of semipermeable membrane.
d) Luminiscent organs.

Q8) a) Explain membrane resting potential.
b) Explain the green house effect.



Total No. of Questions : 20]

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[3924]-302

M.Sc. - II (Sem. - III)

ZOOLOGY (2005 Pattern)

ZY - 321 : Immunology

ZY - 322 : Environmental Biology

ZY - 323 : Fundamentals of Systematics

ZY - 324 : Aquaculture

ZY - 325 : Insect Ecology

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any two optional courses from ZY - 321 to ZY - 325.*
- 2) *Answers to the two courses should be written in separate answer books.*
- 3) *Attempt any two questions from each optional course.*
- 4) *Draw diagrams wherever necessary.*
- 5) *All questions carry equal marks.*

SECTION - I

ZY - 321 : Immunology

- Q1)** What is autoimmunity? Explain autoimmune diseases with suitable examples.
- Q2)** Write notes on (any two) :
- a) Monoclonal antibodies.
 - b) RIA.
 - c) MHC and their significance.
- Q3)** What is antibody diversity? Explain the molecular basis of generation of antibody diversity.
- Q4)** What is Antigen-Antibody reaction? Explain the complement fixation pathways.

SECTION - II

ZY - 322 : Environmental Biology

- Q5)** Give an account of structure and function of an ecosystem.
- Q6)** Define natural resource. Discuss the need and importance of natural resource conservation.

P.T.O.

Q7) Describe sustainable development and its relevance in present scenario.

Q8) Write short notes on :

- a) Energy crisis.
- b) Desertification.
- c) Solid waste disposal.
- d) Principle and objectives of environmental education.

SECTION - III

ZY - 323 : Fundamentals of Systematics

Q9) Write an essay on international code of zoological nomenclature.

Q10) When the keys are required to be constructed? Explain different kinds of keys.

- Q11)** a) Explain the cytotaxonomy based concept.
b) Linnean hierarchical method of animal classification.

Q12) Write short notes on (any four) :

- a) Theories of classification.
- b) Preservation methods for birds and mammals.
- c) Biological species concept.
- d) Concept of phylogeography.
- e) Artificial and natural classification.

SECTION - IV

ZY - 324 : Aquaculture

Q13) Describe the natural and induced breeding methods in fish farming.

Q14) Explain the concept of aquaculture. Add a note on Inland Fisheries.

Q15) Discuss Aquaculture as an applied science. Add a note on its need and importance.

Q16) Write short notes on :

- a) Crab fishery.
- b) Fish pathology.
- c) Pearl formation.
- d) Rearing of oysters.

SECTION - V

ZY - 325 : Insect Ecology

Q17) Write an essay on evolution of insects in water.

Q18) Give an account of evolution of entomophagy in insects.

Q19) Describe the relation between insects and vertebrates.

Q20) Write notes on :

- a) Thermoregulation and insect development.
- b) Phytophagous insects.
- c) Insect Scavengers.
- d) Parasitoid insects.



Total No. of Questions : 12]

[Total No. of Pages : 2

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[3924]-303

M.Sc. - II (Sem. - III)

ZOOLOGY

ZY - 331 : Parasitology

ZY - 332 : Insect Physiology and Biochemistry

ZY - 334 : Genetic Toxicology

(2005 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any two sections.*
- 2) *Attempt any two questions from each section.*
- 3) *All questions carry equal marks.*
- 4) *Draw neat labelled diagrams wherever necessary.*
- 5) *Answers to the two sections should be written in separate book.*

SECTION - I

ZY - 331 : Parasitology

- Q1)** Describe the life cycle, pathogenicity, treatment and control measures of Trypanosoma sps and schistosoma sps.
- Q2)** Explain in detail about genome size, diploid and haploid stages of meiosis in plasmodium.
- Q3)** Give in detail the method of serology and antibody synthesis. Add a note on demonstration of antigen of Entamoeba.
- Q4)** Write notes on any two :
- a) Myiasis.
 - b) Chromatin diminution in Ascaris.
 - c) Parasitic effect benefiting the host.
 - d) Surface antigen diversity.

SECTION - II

ZY - 332 : Insect Physiology and Biochemistry

- Q5)** What is excretion? Describe regulation of nitrogen excretion and water balance in insects.

P.T.O.

- Q6)** Describe the extramicrosomal enzymes involved in insecticide degradation and detoxification.
- Q7)** Describe the physiology of digestion and absorption of proteins, carbohydrates and lipids in insects.
- Q8)** a) Write on structure and function of haemocytes.
b) Explain moulting and juvenile hormones.

SECTION - III

ZY - 334 : Genetic Toxicology

- Q9)** Explain the molecular methods used in detection of mutation.
- Q10)** Explain the cytogenetic methods used for detecting the genotoxic nature of a test compound.
- Q11)** a) Explain chromosomal aberrations with respect to structural changes.
b) What are mutagens? Explain the mechanism of one physical mutagen and one chemical mutagen.
- Q12)** a) Write a note on “mutagenesis and carcinogenesis”.
b) Explain the importance of genetic toxicology.



Total No. of Questions : 8]

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[3924]-401

M.Sc. (Sem. - IV)

ZOOLOGY

ZY - 411 : Entomology - II

(Old & New Common)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any four questions.*
- 2) *Neat and labelled diagrams must be drawn wherever necessary.*
- 3) *All questions carry equal marks.*

- Q1)** What is blastokinesis? Describe different theories of blastokinesis.
- Q2)** Write an essay on regeneration in insects.
- Q3)** Describe female reproductive system of a typical insect. Make a comparison of egg tube with sperm tube.
- Q4)** Write notes on (any two) :
- a) Oviposition.
 - b) Hardorn's experiments.
 - c) Dyar's law.
 - d) Gastrulation in insects.
- Q5)** What is insecticide? Classify the insecticides on the basis of mode of action.
- Q6)** Discuss the economics of pest control.
- Q7)** Describe the Knipling's model for male sterile technique.
- Q8)** Write notes on (any two) :
- a) Pheromonal control measures.
 - b) 3rd generation insecticides.
 - c) Pesticide hazards.
 - d) Repellents.



Total No. of Questions : 8]

[Total No. of Pages : 1

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[3924]-401

M.Sc. - II (Sem. - IV)

ZOOLOGY

ZY - 412 : Genetics - II

(Old & New Common)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any four questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat labelled diagrams must be drawn wherever necessary.*

Q1) What are inborn errors in metabolism? Explain with suitable examples.

Q2) What is pedigree? Explain the importance of pedigree in identifying and analysing genetic diseases.

Q3) How cytogenetic studies are important in identifying diseases and mutations?

Q4) Write short notes on (any four) :

- a) STR.
- b) SNP.
- c) VNTR.
- d) RFLP.
- e) Chromosome walking.

Q5) What is physical mapping? Explain the techniques used in physical mapping.

Q6) “Antibody diversity has genetic background”. Explain.

Q7) a) Explain Rothenbuhler’s experiment on genetics of bee behaviour.
b) What is circadian rhythm? What factors cause circadian rhythm in case of mammals.

Q8) What are Hox genes? Explain role of boundary elements and enhancers in expression of Abd B gene.



Total No. of Questions : 8]

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[3924]-401

M.Sc. (Sem. - IV)

ZOOLOGY

ZY - 413 : Physiology - II

(Old & New Common)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any four questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat diagrams wherever necessary.*

- Q1)** What is respiration? Explain the transport of oxygen and add a note on oxygen dissociation curve.
- Q2)** Explain the mechanical events of cardiac cycle. Add a note on ECG.
- Q3)** Explain the structure of skeletal muscle. Add a note on molecular basis of its contraction.
- Q4)** What is blood? Explain different components of blood and comment of the functions of blood.
- Q5)** a) Explain the role of gastrointestinal hormones in digestion.
b) Explain the cardio-vascular response to exercise.
- Q6)** a) What are neurotransmitters? Explain their different types.
b) What are sense organs? Explain different types of sensory receptors.
- Q7)** a) What is nutrition? Enlist different nutrient molecules. Add a note on their functions.
b) Explain the role of central and peripheral receptors on respiration.
- Q8)** Write notes on :
- a) Blood vessels and their functions.
 - b) Chemotransduction.
 - c) BMR.
 - d) Physiology of hearing.



Total No. of Questions : 20]

[Total No. of Pages : 3

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[3924]-402

M.Sc.

ZOOLOGY

(Old & New) (Sem. - IV)

ZY - 421 : Animal Tissue Culture

ZY - 422 : Pollution Biology

ZY - 423 : Marine Biology

ZY - 424 : Bacterial and Phage Genetics

ZY - 425 : Medical Entomology

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any two sections.*
- 2) *Attempt any two questions from each section.*
- 3) *All questions carry equal marks.*
- 4) *Answers to the two sections should be written in separate answer books.*

SECTION - I

ZY - 421 : Animal Tissue Culture

- Q1)** a) What is serum free medium? Discuss the advantages and disadvantages of such media. [10]
b) Give an account of organ culture in detail with suitable examples. [10]
- Q2)** a) Explain in detail characterization of cell lines. [10]
b) Explain the process of enzymatic disaggregation of tissue for primary cell culture. Add a note on its significance. [10]
- Q3)** a) Explain the application of animal tissue culture. [10]
b) Explain insect cell culture in detail. [10]
- Q4)** Write short notes : [20]
a) Lominar air flow.
b) Cell repositries.
c) Lymphocyte culture.
d) Inverted tissue culture microscope.

P.T.O.

SECTION - II

ZY - 422 : Pollution Biology

- Q5)** Explain bioassay, the criterion of selecting test animals and the significance of such studies.
- Q6)** Discuss how incorrect agricultural practices are responsible for water and soil pollution.
- Q7)** Describe Lithosphere with special emphasis on soil formation and importance of soil as life zone.
- Q8)** Write notes on :
- Sources of Noise Pollution.
 - Global warming.
 - Thermal pollution.
 - Radiation hazards.

SECTION - III

ZY - 423 : Marine Biology

- Q9)** Give an account of the sediments on a sea floor.
- Q10)** Describe Marine Zones. Add a note on the animal diversity of these zones.
- Q11)** Describe a typical “Indian Estuary”. Add a note on the estuarine food web.
- Q12)** Write notes on :
- Biofouling.
 - Animal resources in marine habitat.
 - Primary production in marine environment.
 - Economic impact of boring organisms.

SECTION - IV

ZY - 424 : Bacterial and Phage Genetics

- Q13)** Explain the cascade of lytic and lysogenic cycle in phage lambda.
- Q14)** Comment on :
- Interrupted mating experiment for chromosome mapping.
 - Intergenic and intragenic suppression.

Q15) Explain following :

- a) Development of competence in Bacillus species.
- b) M μ phage as transposon.

Q16) Write short notes on :

- a) Replicative and Non Replicative transposons.
- b) Redundancy and circularly permeability of T₄ phage genome.

SECTION - V

ZY - 425 : Medical Entomology

Q17) Give an account of medical importance of following orders :

Hemiptera and Siphonoptera.

Q18) Explain medical importance of Head louse, Anopheles mosquito, Bed bug and cat flea.

Q19) Describe the destructive influence of insects in relation to human health with suitable examples.

Q20) Write notes on :

- a) Veterinary entomology.
- b) Trypanosomiasis.
- c) Carpet beetle and clothmoth.
- d) Sand flies.



Total No. of Questions : 16]

[Total No. of Pages : 2

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M.Sc.

ZOOLOGY

ZY - 431 : Physiology of Mammalian Reproduction

ZY - 432 : Comparative Invertebrate Histology and Histochemistry

ZY - 433 : Biodiversity Assessment

ZY - 435 : Apiculture

(Old & New) (Sem. - IV)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt any two sections.*
- 2) *Answer any two questions from each section.*
- 3) *Answer to the two sections should be written in separate answer books.*
- 4) *All questions carry equal marks.*
- 5) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

ZY - 431 : Physiology of Mammalian Reproduction

- Q1)** Describe the menstrual cycle and add a note on its hormonal regulation.
- Q2)** Describe the physical changes during pregnancy and comment on its hormonal regulation.
- Q3)** Describe in detail the various methods of contraception.
- Q4)** Write short notes on any two :
- a) Suckling reflex.
 - b) Seasonal breeders.
 - c) Testicular hormones.
 - d) Ageing and reproduction.

SECTION - II

ZY - 432 : Comparative Invertebrate Histology and Histochemistry

- Q5)** Explain the principle and procedure of histochemical detection of Lipids.
- Q6)** What is fixation? Explain formaldehyde as fixative and comment on its merits and demerits.

P.T.O.

Q7) What is staining? Explain the basic mechanism involved in biological staining. Add a note on types of dyes used in histology.

Q8) Write notes on :

- a) Alcian blue.
- b) Muscular tissue.

SECTION - III

ZY - 433 : Biodiversity Assessment

Q9) Write general characters and classification of Arthropoda.

Q10) a) What are key stone species? Explain why is it necessary to conserve?
b) Explain objectives and strategies of conservation.

Q11) Explain diversity and adaptations in animals with respect to their habitat.

Q12) Write short notes on :

- a) Endangered species.
- b) Commensalism.
- c) Rhynchocephala.
- d) In-situ conservation.

SECTION - IV

ZY - 435 : Apiculture

Q13) Describe the digestive system of a worker bee. Add a note on food and feeding behaviour.

Q14) Describe a bee box with a schematic diagram. Add a note on Bee Space.

Q15) Give an account of Royal Jelly, Pollens and bee venom. Elaborate on the techniques of collection.

Q16) Write notes on :

- a) Apis dorsata
- b) Importance of bee keeping in Agriculture.
- c) Bee keeping as small scale industry.
- d) Foraging.

