Total No. of Questions : 8]

SEAT No. :

P458

[Total No. of Pages : 2

[4331] - 101
M.Sc. - I
ZOOLOGY
ZY - 101 : Biochemistry
(Semester - I) (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 neat diagrams wherever necessary.***

Q1) a) What are regular repeating structures? Give the importance of non-covalent forces involved in the stability of protein structure. **[10]**

b) Explain the allosteric protein with suitable example. **[10]**

Q2) a) Discuss the role of pyruvate dehydrogenase complex in formation of Acetyl - CoA. **[10]**

b) Give physiological importance and significance of lipid. **[10]**

Q3) a) Explain the kinetics of bisubstrate reactions. **[10]**

b) Give the structure and function of glutamate dehydrogenase. **[10]**

Q4) Write short notes on: **[20]**

a) Structural polysaccharide.

b) ETC.

c) Glyoxalate cycle.

d) Oxidative deamination.

P.T.O.

Q5) Give the following reactions: **[20]**

a) Citrate $\rightleftharpoons$ Isocitrate.

b) α ketoglutarate $\rightarrow$ Succinyl CoA.

c) Succinate $\rightarrow$ Fumarate.

d) Malate $\rightarrow$ Oxaloacetate.

Q6) a) Explain the process of gluconeogenesis. **[10]**

b) Describe the process of glycogen synthesis and give the role of branching enzyme. **[10]**

Q7) Describe in detail synthesis of IMP. How AMP and GMP are synthesized from IMP and add a note on its regulation. **[20]**

Q8) Write short notes on: **[20]**

a) Deoxy ribonucleotide synthesis.

b) Ketone bodies.

c) Reversible inhibition.

d) Transport of fatty acid.

Total No. of Questions : 8]

SEAT No. :

P459

[Total No. of Pages : 2

[4331] - 102
M.Sc. - I (Semester - I)
ZOOLOGY
ZY - 102 : a) Genetics
b) English for Scientists
(2005 Pattern)

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

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

SECTION - I
ZY - 102 : a) Genetics

Q1) Discuss the mechanism of gene regulation citing suitable examples.

Q2) a) Explain the somatic cell-fusion technique and mention its significance.

b) Discuss the PCR technique and its importance.

Q3) a) Define and explain the "Coupling and repulsion" hypothesis with suitable examples.

b) Give the types and significance of Crossing - Over.

Q4) Answer any two of the following:

a) DNA sequencing methods.

b) Relation between Hardy-Weinberg law and genetic variations.

c) Gene interactions and Mendelian inheritance.

P.T.O.

SECTION - II

ZY - 102 : b) English for Scientists

Q5) What is a scientific paper? Explain how it is different from project writing.

Q6) Explain the characteristics of an abstract with suitable examples.

Q7) How to design a "Title for scientific paper" Give few examples of good and bad titles.

Q8) Write short notes (Any Four):

a) Proof reading.

b) Tables and graphs.

c) Significance of key words.

d) Genetic code as simple language.

e) IMRAD format.

Total No. of Questions : 8]

SEAT No. :

P460

[Total No. of Pages : 2

[4331] - 103
M.Sc. (Semester - I)
ZOOLOGY
ZY - 103 : a) Freshwater Zoology
b) Statistical Methods (or)
Quantitative Methods in Biology
(2005 Pattern)

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) ***All questions carry equal marks.***
4) ***Draw neat labelled diagrams wherever necessary.***

SECTION - I
ZY - 103 : a) Freshwater Zoology

Q1) Comment upon the general organization and life cycles of Crustaceans (Branchiopods). **[20]**

Q2) Give an account of economic importance of fresh water molluscs. **[20]**

Q3) What is biomagnification? Explain the effects of heavy metals in aquatic ecosystem. **[20]**

Q4) Write notes on any four of the following: **[20]**

a) Algal bloom.

b) Lotic biome.

c) Significance of frog tadpoles.

d) Respiratory adaptations in fresh water insects.

e) Diagnostic features of Fairy shrimps.

P.T.O.

SECTION - II

ZY - 103 : b) Statistical Methods

Q5) a) Define the following terms: **[6]**

i) Partition values.

ii) Range.

iii) Quartile - Deviation.

b) The following data gives blood serum cholesterol levels of 10 patients.
240, 260, 290, 245, 255, 288, 272, 263, 277, 250.
Find the range, coefficient of range, mean, variance and standard deviation of the blood serum Cholesterol level. **[10]**

c) Define the scatter diagram, how it is useful for obtaining different types if correlation. **[4]**

Q6) a) Define classical definition of probability. What are the limitations of it? Also define conditional probability. **[6]**

b) The following data gives amount injected (x) and peak area (y) observed in a compound when Chromatographed on GC Column.

x	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
y	17	30	45	56	74	86	108	120

Fit a regression line of y on x and estimate peak area when amount injected in 075 cc sample used. **[10]**

c) It is observed that 3 out of 15 female $B_6C_3F_1$ mice are exposed to liver tumor. What is the probability that in a sample of 8 mice, 2 to 4 mice will be exposed to liver tumor? **[4]**

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

b) Among 64 offspring of a certain cross between Guineas 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% level of significance? (l.o.s.). **[10]**

Q8) a) Explain the chi-square test of goodness of fit. **[10]**

b) For the given data: **[10]**

Age	0-20	20-40	40-60	60-80	80-100
No. of persons	3	17	30	21	9

Draw histogram frequency polygon & frequency curve for the above data.

Total No. of Questions : 8]

SEAT No. :

P461

[Total No. of Pages : 2

[4331] - 201
M.Sc. (Semester - II)
ZOOLOGY
ZY - 201 : A) Developmental Biology
B) Comparative Animal Physiology
(2005 Pattern)

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

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

SECTION - I
A) Developmental Biology

Q1) Explain in detail the process of Mesoderm induction in Xenopus. **[20]**

Q2) Discuss the changes in the sperm head during acrosome reaction and comment on molecular strategy to ensure monospermy. **[20]**

Q3) Describe the fate maps in chick embryo using radioactive cell tracking. **[20]**

Q4) Write notes on any Two of the following: **[20]**

a) Cell ageing.

b) Lens development.

c) Neural competence.

d) Lampbrush Chromosomes.

P.T.O.

SECTION - II

B) Comparative Animal Physiology

Q5) What is biokinetic zone? Explain how poikilotherms adjust with low and high critical temperatures. **[20]**

Q6) Explain the mechanism of hormonal action. Add a note on the chemistry of vertebrate hormones. **[20]**

Q7) a) Describe the respiratory pigments in animals.

b) Explain the structure and functioning of myogenic heart.

[20]

Q8) Write short notes on any four of the following: **[20]**

a) Proteins of Myofilament.

b) Osmolarity and tonicity.

c) Donan equilibrium.

d) Hypothalamus.

e) Modes of nitrogen excretion.

Total No. of Questions : 8]

SEAT No. :

P462

[Total No. of Pages : 2

[4331] - 202
M.Sc.
ZOOLOGY
ZY - 202 : A) Molecular Biology
B) Cell Biology
(Semester - II) (2005 Pattern)

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 right indicate full marks.***

SECTION - I
A) Molecular Biology

Q1) Describe the process of translation in detail and add a note on inhibitors of protein synthesis. **[20]**

Q2) a) What will happen to DNA when it is exposed to **[10]**

i) Enzyme Helicase.

ii) High temperature (100ºC).

b) Explain the ultrastructure of nucleosome and mention its significance. **[10]**

Q3) Write an account on RNA polymerase in prokaryotes and explain how it differs from eukaryotic RNA polymerase. **[20]**

Q4) Write short notes on any two: **[20]**

a) RNA splicing.

b) Propagation of RNA genome.

c) Transposable elements.

d) Cot curves.

P.T.O.

SECTION - II

B) Cell Biology

Q5) What is Cell Cycle? Give the method of analysis of various phases of Cell Cycle. **[20]**

Q6) Describe the role of cytoskeleton in cell architecture and cell motility. **[20]**

Q7) Describe structure and function of ribosomes. **[20]**

Q8) Write short notes on: **[20]**

a) Polymorphism in lysosomes.

b) G-Proteins.

c) Cell fusion and electroporation.

d) Protein import in mitochondria.

Total No. of Questions : 12]

SEAT No. :

P463

[Total No. of Pages : 3

[4331] - 203
M.Sc. (Semester - II)
ZOOLOGY
ZY - 203 : A) Biochemical Techniques
OR
A) Ichthyology
B) Endocrinology
(2005 Pattern)

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 book.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

SECTION - I
A) Biochemical Techniques

Q1) a) Explain the following: **[10]**

i) Flask constant.

ii) Cation exchanger.

iii) Mesh size.

iv) Quire.

v) Sedimentation Coefficient.

b) State the principle, working and advantages of gel filtration. **[10]**

Q2) a) Discuss the various methods for DNA sequencing. **[10]**

b) State the Beer Lambert law. Discuss the working of a Spectro photometer. **[10]**

P.T.O.

Q3) a) State the principle, working and application of Ultracentrifuge. **[10]**

b) What are radio isotopes? Explain the working of GM counter. **[10]**

Q4) Write short notes on: **[20]**

a) Protein sequencing.

b) SDS - PAGE.

c) RQ determination.

d) Affinity chromatography.

OR

A) Ichthyology

Q5) Write an account of anatomical modifications of alimentary canal of fishes. Add a note on feeding habits of fishes. **[20]**

Q6) Describe the structure and function of different types of air bladder found in fishes. **[20]**

Q7) Write an essay on phylogeny of fishes. **[20]**

Q8) Write short notes on (any two): **[20]**

a) Holobranch.

b) Pituitary.

c) Osmoregulation in freshwater fishes.

d) Chemoreceptors in fishes.

SECTION - II

B) Endocrinology

Q9) Describe role of various hormones in Osmoregulation with the help of rennin angiotensin system. **[20]**

Q10) a) Mechanism of hormone action and signal transduction cascade. **[10]**

b) Adenohypophysial hormones. **[10]**

Q11) Describe the X and Y organs. Explain their role in crustacians. **[20]**

Q12) Write notes on: **[20]**

a) Role of hormones in carbohydrate metabolism.

b) Hormone receptors.

c) Hormones as chemical messangers.

d) Gastrointestinal hormones.

Total No. of Questions : 8]

SEAT No. :

P464

[Total No. of Pages : 1

[4331] - 301
M.Sc. - II (Semester - 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 labelled diagrams wherever necessary.***
3) ***All questions carry equal marks.***

Q1) Describe the morphology of insect thorax. Add a note on wing modifications.

Q2) Give the distinguishing characters of following insect orders with at least two examples from two families.

a) Thysanoptera. b) Neuroptera. c) Coleoptera.
d) Dictyoptera. e) Dermaptera.

Q3) Describe the structure of blood vessels in insect. Add a note on mechanism of blood circulation.

Q4) Describe the anatomy of male reproductive system of a generalised insect. Make a comparison of egg tube with sperm tube.

Q5) Describe the morphology and structure of alimentary canal of typical insect and compare it with any fluid feeding insect.

Q6) Write an account of inter-relationship of insects with other Arthropodes.

Q7) Describe the segmentation of abdomen of generalised insect. Add a note on abdominal appendages.

Q8) Write short notes on (any four) of the following:

a) Pulsatile organ. b) Head articulation.
c) Corpora Cardiaca and Corpora allata. d) Fat body.
e) Types of Antenna.

Total No. of Questions : 8]

P464 **[Total No. of Pages : 2**

[4331] - 301
M.Sc. - II (Semester - 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 is a RFLP haplotype? What special value does it have in human genetic analysis? **[20]**

Q2) What properties make mitochondrial gene particularly useful in the study of evolutionary changes in the population. **[20]**

Q3) Define Inbreeding Co-efficient (F) in terms of loss of heterozygosity. **[20]**

Q4) a) What possible explanation can be offered for the loss of heterozygosity in certain population found in the wild? **[10]**

b) Why is the high level of polymorphism in a population required. **[10]**

Q5) What are the mechanisms responsible for genetic drift and how do they differ from founder effects. **[20]**

P.T.O.

Q6) What is gene therapy? Explain different strategies for a gene therapy. **[20]**

Q7) a) What is the relationship between relative fitness and selection Co-efficient.

b) Explain how a balance between selection and mutation can establish a constant allelic frequency for a recessive lethal trait.

[20]

Q8) a) Describe the difference between continuous and discontinuous variation. **[10]**

b) Describe possible pattern of interaction between genotype and environment. **[10]**

Total No. of Questions : 8]

P464 **[Total No. of Pages : 1**

[4331] - 301
M.Sc. - II (Semester - III)
ZOOLOGY
ZY - 313 : Animal 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 structure of luminescent organs. Add a note on biochemical and molecular mechanism of bioluminescence.

Q2) Explain water balance in aquatic invertebrates. Describe methods of gain and loss of water.

Q3) a) Explain Du Bios temperature balance and give its significance.
b) Explain the rate of biological activity of thermal acclimation in homeotherms.

Q4) a) Explain the metabolic rate in relation to body size in marsupials and monotremes.
b) Explain the energy cost of locomotion in running and flying animals.

Q5) What is the resting membrane potential? Describe the factors affecting it.

Q6) Explain the physiological changes due to fluctuations of external environment in animals.

Q7) What is biological rhythm? Explain circadium and lunar rhythms with suitable examples.

Q8) Write notes on:

a) Anacrobiotic metabolism.
b) Extracellular environment.
c) Swim bladder.
d) Electroreceptors.

Total No. of Questions : 20]

SEAT No. :

P465

[Total No. of Pages : 3

[4331] - 302

M.Sc. (Semester - III)

ZOOLOGY

ZY - 321: Immunology

ZY - 322: Environmental Biology

ZY - 323: Fundamentals of Systematics

ZY - 324: Aquaculture

ZY - 325: Insect Ecology

(2005 Pattern)

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

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

SECTION - I

ZY - 321 : Immunology

Q1) What is complement fixation? Explain the classical pathway of complement fixation.

Q2) What is an antibody? Explain the structure and functions of the various classes of Immunoglobulins.

Q3) a) Describe the autoimmune diseases with suitable examples.

b) Explain the structure and functions of T-cell receptors.

Q4) Write notes on (any two):

a) ELISA.

b) Lymphoid tissues.

c) Monoclonal antibodies.

P.T.O.

SECTION - II
ZY - 322 : Environmental Biology

Q5) Describe the conservation strategies of natural resources - soil, water and wildlife.

Q6) Explain the effects of heavy metals and pesticides on biomass with suitable examples.

Q7) Describe the impact of human activities on environment.

Q8) Write notes on any two from the following:

a) Aquatic ecosystem.

b) Global warming.

c) Objectives of environmental education.

d) Forest conservation.

SECTION - III
ZY - 323 : Fundamentals of Systematics

Q9) Explain the various methods of collection and preservation of animal specimen for taxonomic work with suitable examples.

Q10) What is zoological nomenclature? Explain the operative principles and objectives of ICZN.

Q11) Explain in detail morphology based taxonomy and molecular systematics.

Q12) a) Explain the theories of biological classification.

b) Write a note on species category and Sibling Species.

SECTION - IV
ZY - 324 : Aquaculture

Q13) Explain fish pond types, and describe its preparation and maintenance.

Q14) What is aquaculture? Describe its concept and types. Add a note on aquaculture as an applied science.

Q15) Explain the fishing methods and preservation of fresh water prawns. Describe culture methods of prawns.

Q16) Write short notes on:

a) Fish diseases.

b) Harvesting techniques of fishes.

c) Pearl formation.

d) Insertion of nucleus.

SECTION - V

ZY - 325 : Insect Ecology

Q17) Explain in detail the effect of Biotic and physical factors of the environment on Insects.

Q18) a) Write a note on phytophagus insects.

b) Predacious insects.

Q19) Write a detail note on evolutionary effects of predation by insectivorous vertebrates.

Q20) Write short notes (any four):

a) Entomophagy.

b) Host specificity of phytophagus insects.

c) Soil insects.

d) Insect scavengers.

e) Aquatic Insects.

Total No. of Questions : 12]

SEAT No. :

P466

[Total No. of Pages : 2

[4331] - 303
M.Sc. - II
ZOOLOGY
ZY - 331 : Parasitology
ZY - 332 : Insect Physiology and Biochemistry
ZY - 334 : Genetic Toxicology
(Semester - III) (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) ***Answers to the two sections should be written in separate answer book.***

SECTION - I
ZY - 331: Parasitology

Q1) Describe the life cycle, pathogenicity, treatment and control measures of Trypanosoma Sps and Echinococus Sps.

Q2) What is host-parasite system? Describe in detail pre-adaptations to infectiousness and transmission.

Q3) Describe surface antigen diversity. Add a note on interspecific and strain variation in Plasmodium.

Q4) Write notes on (any two):

a) Myiasis.

b) Complement fixation test.

c) Parasitism and altruism.

d) Chemical control of parasites.

P.T.O.

SECTION - II

ZY - 332 : Insect Physiology and Biochemistry

Q5) Describe the physico - chemical characteristics of haemolymph and add a note on types of haemocytes.

Q6) Describe the ventillatory mechanism in insect.

Q7) a) Steroid hormones in insect.

b) Structure of integument.

Q8) Describe the structure of fat body and add a note on Integration of carbohydrate and amino-acid metabolism.

SECTION - III

ZY - 334 : Genetic Toxicology

Q9) What are mutagenic agents? Explain the action of any four mutagens.

Q10) Explain the various molecular methodologies to detect mutations.

Q11) Explain Ame's test and add a note on its applications.

Q12) a) Write a note on gene mutation.

b) Explain the micronucleus test.

Total No. of Questions : 8]

SEAT No. :

P467

[Total No. of Pages : 1

[4331] - 401
M.Sc. - II (Semester - IV)
ZOOLOGY
ZY - 411 : Entomology - II
(2005 Pattern)

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

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

Q1) Describe Metamorphosis in Insects. Add a note on hormonal control of metamorphosis.

Q2) What is regeneration? Describe this phenomenon in insects.

Q3) What is hatching? Describe hatching mechanism in insects.

Q4) Write short note on any two of the following:

a) Types of insect larvae.
b) Hadorn's Experiment.
c) Gastrulation in insects.
d) Parthenogenesis.

Q5) Define Pest. Discuss the need and importance of insect pest control.

Q6) What is Biological control. Illustrate with suitable examples, the application of this method for controlling Agricultural Pest.

Q7) Give an account of 3rd generation insecticides.

Q8) Write short notes on any two of the following:

a) Pesticidal residues.
b) Systemic insecticides.
c) Dusters.
d) Antifeedants.

Total No. of Questions : 8]

P467 **[Total No. of Pages : 2**

[4331] - 401
M.Sc. - II (Semester - IV)
ZOOLOGY
ZY - 412 : Genetics - II
(2005 Pattern)

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) a) Explain the molecular genetics of DMD. How are the genes for DMD localized by genetic linkage analysis.

b) What is positional cloning? Explain positional cloning using genetic linkage mapping with respect to cystic fibrosis.

Q2) a) Explain the molecular and biochemical basis of Tay-Sachs disease.

b) Explain the Bone Marrow transplantation as a mode of treatment of lysosomal storage disease.

Q3) What are proto-oncogenes and tumor suppressor genes? How do they differ in their mechanism?

Q4) Explain in brief:

a) Role of Recombination activating genes and recombination signalling sequences.

b) Cell hydrids.

Q5) a) Explain the pre-natal diagnostic methods.

b) Elucidate the role of genes in "Learning and memory formation" in Drosophila.

P.T.O.

Q6) Explain the genetic basis of cell-division control.

Q7) Explain the role of Homeotic genes in pattern formation, with respect to Drosophila.

Q8) a) Explain the role of Twin studies and adaption studies in determining the 'Nature' and 'Nurture' factor.

b) Write short notes on:

i) Penetrance and expressivity.

ii) Use of pedigree studies in human genetics.

Total No. of Questions : 8]

P467 **[Total No. of Pages : 1**

[4331] - 401
M.Sc. - II (Semester - IV)
ZOOLOGY
ZY - 413 : Animal Physiology - II
(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 types of sensory receptors, receptor potential mechanism and receptor adaptation.

Q2) What is blood pressure? Explain factors affecting on it. Add a note on hypotension.

Q3) Explain the structure of eye and describe the physiology of vision.

Q4) Explain the role of central and peripheral receptors in respiration.

Q5) Explain various types of neurotransmitters and their receptors. Add a note on their metabolism.

Q6) a) Give the composition of blood and explain the functions of each component.
b) Explain the electro-chemical events during muscle contraction.

Q7) What is digestion? Explain the physiology of digestion in intestine. Add a note on gastrointestinal hormones.

Q8) Write notes on:
a) Pace maker.
b) Ionic basis of excitation and conduction.
c) Structure and functions of nerve cell.
d) Other functions of respiratory system.

Total No. of Questions : 20]

SEAT No. :

P468

[Total No. of Pages : 4

[4331] - 402

M.Sc.

ZOOLOGY

ZY - 421: Animal Tissue Culture

ZY - 422: Pollution Biology

ZY - 423: Marine Biology

ZY - 424: Bacterial and Phage Genetics

ZY - 425: Medical Entomology

(Semester - IV) (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) ***Answers to the two sections should be written in separate answer books.***

SECTION - I

ZY - 421 : Animal Tissue Culture

Q1) Describe in detail the various tissue culture media.

Q2) Write notes on:

a) Establishment and Maintenance of lymphocyte culture.

b) Hybridoma culture and its application.

Q3) a) Explain the importance of serum in tissue culture media. Add a note on serum free media.

b) Describe stem cell cultures.

P.T.O.

Q4) Write notes on (any four):

a) Histotypic cultures.

b) Suspension cultures.

c) Inverted Microscopes.

d) Cryopreservation of cell lines.

e) Cell viability counting by Trypan blue.

SECTION - II
ZY - 422 : Pollution Biology

Q5) Enlist the plant origin pesticides and stress on their need and importance in present circumstances.

Q6) Discuss Noise Pollution with respect to scientific and technological development.

Q7) Describe the various means of monitoring air pollution.

Q8) Write notes on:

a) Algal bloom.

b) Biomagnification.

c) Global warming.

d) Trans boundary disposal of waste.

SECTION - III
ZY - 423 : Marine Biology

Q9) Give an account of animal resources in marine environment.

Q10) What is an estuary? Give a detailed account on the types of estuaries.

Q11) Give a detailed account of marine environment with suitable examples.

Q12) Write notes on:

a) Algal resource.

b) Biofouling.

c) Marine animal diversity.

d) Culturing marine organisms.

SECTION - IV

ZY - 424 : Bacterial and Phage Genetics

Q13) What are the characteristics of the bacteriophage lambda genome. Explain the genetic regulation of its life cycle.

Q14) Distinguish between generalised and restricted transduction in bacteria. How is transduction used in gene mapping?

Q15) Explain the following (any two):

a) Is elements and mechanism of transposition.

b) Replication of T_4 phage.

c) Complementation test.

Q16) Write short notes on:

a) Retrovirus and reverse transcriptase.

b) Cistron.

c) Phage μu.

d) S-R variation.

SECTION - V

ZY - 425 : Medical Entomology

Q17) Define vector. Explain the role of vectors in the transmission of diseases from family Reduviidae and Cimicidae.

Q18) Describe role of insect in veternary entomology especially their role as a disease spreading agent.

Q19) Describe the causative agent, pathogenecity and control measures of yellow fever, Bubonic and Pneumonic plague.

Q20) Write notes on:

a) Silver fish.

b) Leishmaniasis.

c) Xenopsylla cheopsis.

d) Hippobosca.

Total No. of Questions : 16]

SEAT No. :

P469

[Total No. of Pages : 3

[4331] - 403

M.Sc. (Semester - IV)

ZOOLOGY (2005 Pattern)

ZY - 431: Physiology of Mammalian Reproduction

ZY - 432: Comparative Invertebrate Histology and histochemistry

ZY - 433: Biodiversity Assessment

ZY - 435: Apiculture

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

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

SECTION - I

ZY - 431 : Physiology of Mammalian Reproduction

Q1) Describe the phenomenon of lactation. Add a note on suckling reflex.

Q2) Describe the role of testicular, ovarian and other hormones in reproduction with feed back relationships.

Q3) Write short notes on:

a) Puberty.

b) Reproductive patterns.

c) Artificial insemination.

d) In Vitro fertilization and embryology.

Q4) Describe artificial control of reproduction.

P.T.O.

SECTION - II

ZY - 432 : Comparative Invertebrate Histology and Histochemistry

Q5) Describe paraffin embedding method.

Q6) Describe the procedure for detection of glycogen and mucopolysaccharides.

Q7) Describe histochemical methods for the detection of non specific esterases and alkaline phosphatases.

Q8) Write notes on:

a) Muscular tissue.

b) Connective tissue.

SECTION - III

ZY - 433 : Biodiversity Assessment

Q9) Explain in detail classification of class Mammalia upto order level with suitable examples.

Q10) Describe the necessity and importance of wildlife conservation.

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

Q12) Write short notes on:

a) Commensalism.

b) Endangered species.

c) Zoogeographical sealms.

d) Rhynchocephalia.

SECTION - IV

ZY - 435 : Apiculture

Q13) Describe the caste system in honey bees and add a note on the division of labour.

Q14) Give a comparative account of the morphological features of Queen, Drone and Worker of *Apis cerana*.

Q15) Give an account of the Bee-Plant relationship. Elaborate upon planned pollination services.

Q16) Write notes on:

a) Royal Jelly.

b) *Apis dorsata*.

c) Fungal diseases in bees.

d) Communication in bees.