Total No. of Questions : 8]

SEAT No. :

P438

[Total No. of Pages : 2

[4231] - 101
M.Sc. - I
ZOOLOGY
ZY - 101 : Biochemistry
(2005 Pattern) (Semester - I)

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) Define peptide bond. "Peptide bond is rigid". Justify the statement. **[10]**

b) Describe the storage and structural polysaccharide with suitable example of each. **[10]**

Q2) a) What is uncouplar? Give its role and significance. **[10]**

b) Explain the importance of enzyme kinetics with suitable example. **[10]**

Q3) a) Explain in detail secondary structure of protein molecule. **[10]**

b) Discuss the methods used for N-Terminal determination of peptide. **[10]**

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

a) Redox potential.

b) Enzyme inhibition.

c) Regulatory enzyme.

d) Isozyme.

P.T.O

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

a) Glucose $\rightarrow$ Glucose 6 Phosphate

b) Fructose 1, 6 biphosphate $\rightleftharpoons$ Dihydroxy acetone phosphate + Glyceraldehyde phosphate

c) Glycerate 3-phosphate $\rightleftharpoons$ Glycerate-2 phosphate

d) Phosphoenol pyruvate $\rightarrow$ pyruvate

Q6) Describe in detail TCA cycle? Discuss its amphibolic nature and add a note on glyoxalate cycle. **[20]**

Q7) a) Describe the process of β-oxidation of saturated fatty acid. **[10]**

b) Explain the multienzyme complex system with representative example. **[10]**

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

a) High energy molecules.

b) Importance of lipid in cell membrane.

c) Glycosaminoglycans.

d) Ketone bodies.

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Total No. of Questions : 8]

SEAT No. : ____

P439

[Total No. of Pages : 2

[4231] - 102

M.Sc. - I

ZOOLOGY

ZY - 102 : A) Genetics

B) English for Scientists

(2005 Pattern) (Semester - I)

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) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

A) Genetics

Q1) "Gene interactions alter the Mendelian inheritance". Explain with suitable examples.

Q2) a) Give a brief account of gene manipulation technique and the tools involved in it.

b) Discuss the Hybridoma technique and its applications.

Q3) a) Discuss the influence of environment on the inheritance of quantitative traits.

b) Give the types of crossing-over and the factors influencing them.

Q4) Answer any two of the following :

a) Chromosome mapping.

b) Concept of Lac-operon.

c) Sources of genetic variations and their impact on population.

P.T.O.

SECTION - II

B) English for Scientists

Q5) Explain the importance of English in science and technology.

Q6) What are qualities of a good "title" for a scientific paper? Explain with suitable example.

Q7) What is IMRAD format? Why it is prefered?

Q8) Write short notes (any two) :

a) Acronym

b) Jargan

c) Galley-proof

d) Key words and their significance

e) Styles of citations

Total No. of Questions : 8]

SEAT No. :

P440

[Total No. of Pages : 3

[4231] - 103

M.Sc. (Semester - I)

ZOOLOGY (2005 Pattern)

ZY - 103 : A) Freshwater Zoology
B) Statistical Methods (or)
Quantitative Methods in Biology

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

Instructions to the candidates:

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

SECTION - I

ZY - 103 : A) Freshwater Zoology

Q1) Give an account of general organization of freshwater Rotifers. **[20]**

Q2) Explain the general life cycle of Anurans and Urodels and add a note on significance of frog tadpoles. **[20]**

Q3) Describe adaptations for respiration and locomotion in fresh water insects. **[20]**

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

a) General features of Tadpole Shrimps (Triops)

b) Biomagnification in aquatic ecosystem.

c) Economic importance of Bivalves.

d) Ephemeral biome.

e) Naiad.

P.T.O.

SECTION - II

ZY - 103 : B) Statistical Methods

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

i) Mutually exclusive events,

ii) Occurrence of at least one of the event,

iii) Occurrence of none the event.

b) The administrator of hospital has recorded a study of the amount of time a patient must be wait before being treated by a causality doctor. The following data were collected on a typical day (Waiting time in min.) 12, 16, 21, 20, 24, 3, 11, 17, 29, 18, 26, 4, 7, 14, 25, 1, 27, 15, 16, 5.

i) Construct a frequency distribution using six classes of equal length.

ii) Also obtain less than and more than cumulative frequencies of all classes.

iii) Hence find the no. of patients whose waiting time is more than 20 mins. and less than 25 mins. **[10]**

c) Define p.m.f. of Binomial and Poisson distribution. **[4]**

Q6) a) Define normal distribution and state the properties of it. **[6]**

b) Define correlation, state the different types of correlation. **[10]**

Compute Karl Pearson's coefficient of correlation between age (in years) and blood pressure in (mm/Hg.) for 7 individuals.

Age	48	50	58	62	65	70	72
B.P.	120	118	122	123	125	126	128

c) If the probability that an individual suffer from a bad reaction from a certain injection is 0.001, determine the probability that out of 2000 individuals exactly 3 will suffer a bad reaction. **[4]**

Q7) a) Explain the chi-square test of goodness of fit. **[10]**

b) Thirty microgram of vitamin B_{12} were given intramuscularly every fourth week to 6 patients of pernicious anemia during period of remission. The results are given below :

Patient No	1	2	3	4	5	6
Before therapy	12.2	11.3	14.7	11.4	11.5	12.7
After therapy	13	13.4	16	13.6	14	13.8

Do the data indicate that there will be real improvements in hemoglobin level? Use 5% level of significance. **[10]**

Q8) a) Define the following terms : **[10]**

i) Null hypothesis.

ii) Alternative hypothesis.

iii) Critical Region.

iv) Type I Error.

b) A Besal metabolic rates (BMR, Calories per minute after fasting) follows normal distribution with mean 1.6 and variance unity. **[10]**

Find i) probability that BMR will lie between 1.3 & 1.9.

ii) probability that BMR will less than 1.2.

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Total No. of Questions : 8]

SEAT No. : ____

P441

[Total No. of Pages : 2

[4231] - 201

M.Sc. (Sem. - II)

ZOOLOGY (2005 Pattern)

ZY - 201 : A) Developmental Biology
B) Comparative Animal Physiology

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 must be drawn wherever necessary.***

SECTION - I

A) Developmental Biology

Q1) Comment upon Hayflicks experiments on finite life span of fibroblasts and role of DNA repair.

Q2) Describe the process of Lens development and comment on programmed cell death during the process.

Q3) Explain the process of oogenesis and comment on synthesis and storage of maternal transcripts.

Q4) Write notes on any two of the following :

a) Mesoderm induction.

b) Role of Hensen's node in birds.

c) Molecular signaling during neural induction.

d) Regulation of sperm motility.

P.T.O

SECTION - II

B) Comparative Animal Physiology

Q5) Explain the structure and dynamics of a mammalian heart.

Q6) Explain the sliding filament theory of muscle contraction.

Q7) a) Explain the mechanism of photoreception.

b) Describe respiratory pigments in animals.

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

a) Excretory modes of various animals.

b) Neurohormones.

c) Gill respiration.

d) BMR

e) Chemistry and functions of Thyroid hormone.

Total No. of Questions : 8]

SEAT No. :

P442

[Total No. of Pages : 2

[4231] - 202

M.Sc. (Semester - II)

ZOOLOGY (2005 Pattern)

ZY - 202 : A) Molecular Biology
B) Cell Biology

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 transcription of eukaryotic gene and add a note on post transcriptional processing. **[20]**

Q2) a) Explain in brief the structure of 10 nm and 30 nm chromatin fiber.**[10]**

b) Enlist and explain in brief the different physical properties of DNA.**[10]**

Q3) Discuss the role of following in the process of DNA replication. **[20]**

a) DNA polymerase
b) Origin of replication.
c) Okazaki fragment.
d) Helicase (Dna B).

Q4) a) Describe the process of elongation in translation in E.Coli. Mention the role of different EF involved into it. **[10]**

b) Discuss the structure of Watson and crick model of DNA. **[10]**

P.T.O

SECTION - II

B) Cell Biology

Q5) Explain the chemistry and molecular structure of plasma membrane. Add a note on active transport. **[20]**

Q6) Describe the structure and function of endoplasmic reticulum. **[20]**

Q7) Discuss the various phases of cell cycle and give the mechanism of regulation of cell cycle. **[20]**

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

a) Cell fusion and electroporation.

b) Glyoxysomes.

c) Molecular organization of flagellum.

d) Nucleocytoplasmic interactions.

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Total No. of Questions : 12]

SEAT No. : ____

P443

[Total No. of Pages : 2

[4231] - 203

M.Sc. (Semester - II)

ZOOLOGY (2005 Pattern)

ZY - 203 : A) Biochemical Techniques

OR

A) Ichthyology

B) Endocrinology

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

i) Stacking gel ii) Quire

iii) RF iv) C terminal

v) Void volume

b) State the principle, working and applications of manometric technique. **[10]**

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

b) Discuss the principle, working and advantages of molecular exclusion chromatography. **[10]**

Q3) a) Discuss the principle, working and application of ion exchange chromatography. **[10]**

b) State the principle and discuss the working and application of the ultracentrifuge. **[10]**

P.T.O.

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

a) Uses of radio isotopes in biology.
b) GM counter.
c) TLC
d) SDS-PAGE.

OR

A) Ichthyology

Q5) Describe in detail structure and function of gills. Add a note on respiratory functions of blood. **[20]**

Q6) Describe the external morphology of a fish. Write an account of colouration and colour change mechanism in fishes. **[20]**

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

Q8) Write notes on <u>any two</u> of the following : **[20]**

a) Swim bladder
b) Extinct cyclostomata.
c) Feeding habits of fishes.
d) Catadromous and anadromous fishes.

<u>SECTION - II</u>

B) Endocrinology

Q9) Describe hypothamo-hypophysiotropins. **[20]**

Q10) Explain endocrine regulation of metabolism and moulting in crustaceans. **[20]**

Q11) a) Adenohypophysial hormones. **[10]**
b) Role of hormones in colour change in crustaceans. **[10]**

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

a) Hormones as chemical messengers.
b) Role of Pancreatic hormones in carbohydrate metabolism.
c) Hormonal regulation of yolk synthesis.
d) Control of calcium metabolism.

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Total No. of Questions : 8]

SEAT No. :

P444

[Total No. of Pages : 2

[4231] - 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 modification of mouth parts in insects.

Q2) Discuss inter-relationship of insects with other Arthropodes.

Q3) Describe the structure and functioning of respiratory system in generalised insect.

Q4) Give the distinguishing characters of following insect orders with at least two examples from two families.

a) Lepidoptera
b) Odonata
c) Diptera
d) Thysanura
e) Protura

Q5) Describe the structure and functions of Central Nervous system in class insecta.

Q6) Describe the anatomy of female reproductive system and add a note on types of reproduction.

P.T.O

Q7) Describe the fundamental plan of generalised insect leg. Give the various modifications with their functional significance.

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

a) Head Orientation.

b) Malpighian tubules.

c) Pro-ventriculus.

d) Exocrine glands.

e) Tentorium.

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Total No. of Questions : 8] **[Total No. of Pages : 1**

P444

[4231]-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) Explain the following giving suitable examples :

a) Disruptive selection. b) Directional selection.

Q2) Describe the features present in Mitochondrial DNA that makes it suitable for studying genetic relationship among organism.

Q3) Write short notes on the following:

a) Paralogous gene b) VNTRs

c) RFLP d) Inbreeding

Q4) What is gene therapy? What is the current status of gene therapy research? What are the ethical issues surrounding gene therapy?

Q5) Distinguish between following pairs :

a) Missense mutation and Non-sense mutation.

b) Positive and Negative frameshift mutation.

Q6) Describe the following terms :

a) Genetic drift b) PCR

Q7) Describe Hardy-Weinberg Law for distribution of alleles in a population and distribution of genotype in a population and show how these two are related.

Q8) Explain why is it valuable to have a high degree of heterozygosity in a population.

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Total No. of Questions : 8] **[Total No. of Pages : 1**

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[4231]-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) Give the significance of fat and glycogen as energy storage in animals and add a note on effects of high altitude on energy metabolism.

Q2) Explain the concept of action potential. Add a note on various ion channels.

Q3) Explain the mechanism of temperature compensation in homeotherms during extreme high and low environments.

Q4) a) Explain the problems of diving and strategies to reduce them.
b) Explain acclimatization and acclimation in animals.

Q5) Describe the structure and function of electroreceptors and electroorgans.

Q6) a) Explain the mechanism of uric acid excretion.
b) Explain osmoregulation in terrestrial vertebrates.

Q7) Describe in detail photoperiodism in animals. Add a note on biological clock.

Q8) Write notes on :

a) Gas float.
b) Luminiscent organs.
c) Intracellular environment.
d) Brown fat.

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Total No. of Questions : 20]

SEAT No. : ____

[Total No. of Pages : 3

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[4231] - 302
M.Sc. (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) ***Neat diagrams must be drawn wherever necessary.***
5) ***All questions carry equal marks.***

SECTION - I

ZY - 321 : Immunology

Q1) Explain the theories of antibody synthesis and add a note on molecular basis of generation of antibody diversity.

Q2) Explain the cellular basis of Immunity and add a note on T-Cell receptors.

Q3) a) Explain the immunological role of HLA.

b) Explain the alternative pathway of complement fixation.

Q4) Write notes on (any two) :

a) RIA.

b) Vaccines.

c) Allergy.

P.T.O.

SECTION - II

ZY - 322 : Environmental Biology

Q5) What is pollution? Explain various gaseous pollutants and their effects on environment.

Q6) What is sustainable development? Describe its basic aspects, and add a note on waste disposal.

Q7) What is resource conservation? Describe forest conservation and management.

Q8) Write notes on any two from the following :

a) Terrestrial ecosystem.

b) Effects of pesticides on environment.

c) Objectives of environmental education.

d) Heavy metal pollution.

SECTION - III

ZY - 323 : Fundamentals of Systematics

Q9) What are taxonomic keys? Explain different types of keys and add a note their merits and demerits.

Q10) What is five kingdom classification? Explain in detail Linnean hierarchy.

Q11) Explain in detail molecular phylogenetics.

Q12) Write notes on :

a) Curreting process.

b) Sibling species.

SECTION - IV

ZY - 324 : Aquaculture

Q13) Explain fishing techniques, preservation and processing of fish.

Q14) Describe the types of prawns and culturing of fresh water prawns.

Q15) Describe the process of pearl formation. Add a note on collection and rearing of oysters.

Q16) Write short notes on :

a) Fish diseases.

b) Induced breeding.

c) Crab culture.

d) Aquaculture as applied science.

SECTION - V

ZY - 325 : Insect Ecology

Q17) Write a detail note on the relationship between vascular plants and insects.

Q18) a) Thermoregulation in insects.

b) Soil insects.

Q19) What is evolution and explain the evolution of entomophagy?

Q20) Write short notes (any four):

a) Parasitoid insects.

b) Insects predators of vertebrates.

c) Different mode of feeding in insects.

d) Insect parasites.

e) Effect of humidity on insects.

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Total No. of Questions : 12]

SEAT No. : ____

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[Total No. of Pages : 2

[4231] - 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 Leishmania sps. and Ancylostoma sps.

Q2) a) Describe Variable Surface Glycoproteins (VSG) and VSG gene expression in Trypanosoma.

b) Give an account of parasites and social behaviour of hosts.

Q3) Describe in detail the various prophylatic and control measures of parasites.

Q4) Write notes on (any two) :

a) Radio immunoassay.

b) Manipulation of host behaviour.

c) Myiasis

d) Interspecific and strain specific in Taenia.

P.T.O.

SECTION - II

ZY - 332 : Insect Physiology and Biochemistry

Q5) Describe the structure, chemistry and sclerotization of Integument.

Q6) Describe the role of microsomal and extramicrosomal enzymes in insecticide degradation.

Q7) a) Explain structure and functions of fat body.
b) Neurosecretory hormones.

Q8) Describe structure and physiology of flight muscle.

SECTION - III

ZY - 334 : Genetic Toxicology

Q9) What is toxicology? Explain the various branches of toxicology and add a note on importance of genetic toxicology.

Q10) What are chromosomal aberrations? Explain their various types.

Q11) Describe the Ame's test to assess the mutagenecity of a test compound.

Q12) a) Explain the micronucleus test and give its importance.
b) Explain any two molecular methods to detect mutation.

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Total No. of Questions : 8]

SEAT No. : ____

P447

[Total No. of Pages : 1

[4231] - 401

M.Sc. - II (Semester - IV)

ZOOLOGY (2005 Pattern)

ZY - 411 : Entomology - II

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) Give an account of Gastrulation in insect. Add a note on theories of Gastrulation.

Q2) Describe growth in post-embryonic development of insect and add note on endocrine control of metamorphosis.

Q3) Describe the types of Ovarioles and give an account of Oogenesis.

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

a) Paedogenesis.
b) Hadorn's experiment.
c) Dorsal closure.
d) Sex determination in insects.

Q5) Describe the Knipling's model for male sterile-technique.

Q6) Explain the pesticidal hazards and suggest antidotes.

Q7) Make a brief survey of the methods of pest control, state, importance of each method.

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

a) Nature of damage caused by insect pests.
b) Economics of pest control.
c) Insect repellants.
d) Contact poison.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 1**

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[4231] - 401

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

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 is genomic imprinting? Explain the genetic basis of genomic imprinting with respect to prader Willi and Angelman Syndrome.

Q2) Explain the techniques used in physical mapping of genes.

Q3) a) Explain in detail the circadian rhythum in Drosophila.
b) Describe about the hygienic and unhygienic traits in bees. Also explain the studies of Rothen Buhler on bee behaviour.

Q4) Describe the homeotic genes in Drospophila.

Q5) a) Explain the mechanism of 'X' inactivation in humans. Which genes escape inactivation.
b) Explain the genetic basis of any two blood disorders.

Q6) a) Explain the role of TSG gene in cancer formation.
b) 'Retroviral genes have their cellular counter parts' - Justify the statement with reference to v-one and c-one genes.

Q7) Write short notes on :
a) Genetic Markers.
b) Genetic basis of antibody diversity.

Q8) What are Hox genes? Explain the role of Boundary elements (Fab) and iabs in regulating abd B gene expression.

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Total No. of Questions : 8] **[Total No. of Pages : 1**

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[4231] - 401
M.Sc. - II (Semester - IV)
ZOOLOGY (2005 Pattern)
ZY - 413 : Animal Physiology - II

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 eye and describe the physiology of vision.

Q2) What is resting membrane potential? Explain the factors affecting on it. Add a note on all or none law.

Q3) What is blood clotting? Explain the role of Extrinsic and Intrinsic factors on it.

Q4) a) Explain the mechanism of lung ventilation.
b) What is BMR? How it is determined?

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

Q6) Describe the anatomy of heart. Add a note on mechanical events of cardiac cycle.

Q7) Describe the structure of skeletal muscles in detail. Add a note on physical properties and physiology of muscle contraction.

Q8) Write notes on :
a) Nutrients and nutritive types.
b) Hypertension.
c) Twitch summation and tetanus.
d) Saltatary conduction.

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Total No. of Questions : 20]

SEAT No. : ____

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[Total No. of Pages : 3

[4231] - 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

(2005 Pattern) (Semester - IV)

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) Explain in detail the sterilization methods used in animal tissue culture. **[20]**

Q2) a) Describe the methods used to establish Primary Cell Culture. **[10]**

b) What are cell lines? Add a note on nomenclature of cell lines. **[10]**

Q3) Describe the biochemical and genetic characterization of cell lines. **[20]**

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

a) Insect cell lines.

b) Organ Cultures.

P.T.O.

SECTION - II

ZY - 422 : Pollution Biology

Q5) Give an account of composition and Structure of Atmosphere.

Q6) Describe the causes and effects of degradation of land with suitable examples.

Q7) Describe Bio-magnification and Algal bloom as important phenomenon of water pollution.

Q8) Write notes on :

a) Noise pollution.

b) Global warming.

c) Soil erosion.

d) Pesticide pollution.

SECTION - III

ZY - 423 : Marine Biology

Q9) Describe the marine zones. Add a note on the animal diversity.

Q10) What is biofouling? Elaborate on the economic impact and control measures.

Q11) Describe marine resources with special reference to culturing of marine organisms.

Q12) Write notes on :

a) Food chain in a marine habitat.

b) Estuarine food web.

c) Primary productivity in sea.

d) Subdivisions of marine environment.

SECTION - IV
ZY - 424 : Bacterial and Phage Genetics

Q13) What are the different modes of genetic exchange in bacteria? Explain the transformation process in detail.

Q14) What are bacteriophages? How are they classified? Differentiate between the life cycle of a DNA and RNA phage.

Q15) Explain the following (any two) :

a) Complementation test.
b) Transposable genetic elements.
c) Restricted transduction.

Q16) Write short notes on :

a) Suppressor mutations.
b) Drug resistance in bacteria.
c) Retrovirus.
d) Mu bacteriophage.

SECTION - V
ZY - 425 : Medical Entomology

Q17) Describe role of insects in veternary entomology especially their role as a disease spreading agent.

Q18) Describe causative agent, pathogenecity and control measures of Leishmaniasis and malaria.

Q19) Define house hold insects. Describe their importance in relation to human health.

Q20) Write notes on :

a) Bartonellacea.
b) Pthirus pubis.
c) Trypanosomiasis.
d) Cloth moth.

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Total No. of Questions : 16]

SEAT No. : ____

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[Total No. of Pages : 3

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M.Sc. - II (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 in details oestrous and menstrual cycles in mammals. Add a note on ovarian events.

Q2) Write in details the use of contraceptive devices in controlling reproduction.

Q3) Write notes on :

a) Hormonal regulation of lactation.

b) Role of hormones in pregnancy.

c) Ovarian hormones.

d) Artificial insemination.

Q4) Give a detailed account of reproductive dysfunctions.

P.T.O.

SECTION - II

ZY - 432 : Comparative Invertebrate Histology and Histochemistry

Q5) Describe the Gomori procedure for localizing phosphatase activity.

Q6) Describe the types, structure and function of epithelialtissue.

Q7) Describe paraffin embedding method.

Q8) Write notes on :

a) Immunohistochemical staining.

b) Microtome.

SECTION - III

ZY - 433 : Biodiversity Assessment

Q9) What are key stone species? Explain why it is necessary to conserve?

Q10) Explain in detail classification of class Aves upto order level with suitable examples.

Q11) What are natural resources? Explain the need and management of resources.

Q12) Write notes on :

a) Zoogeographical realms.

b) Techniques to assess biodiversity.

c) Wildlife management in India.

d) Aquatic adaptations.

SECTION - IV

ZY - 435 : Apiculture

Q13) Give an account of various Bacterial and Viral diseases in honey bees.

Q14) Describe the life cycle of honey bees with suitable illustrations and add a note on the role of bees milk and bee bread in the larval development.

Q15) Describe the respiratory system of a honey bee and add a note on air sacs.

Q16) Write notes on :

a) Polymorphism in honey bees.

b) Foraging behavior.

c) Bee venom.

d) Greater Wax Moth.

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