Total No. of Questions : 8] **[Total No. of Pages : 2**

P985

[3724]-101

M.Sc. - I (Sem. - I)

ZOOLOGY

ZY-101 : Biochemistry

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

a) What is glycosidic bond? Explain the linkages present in storage polysaccharide.

b) Give the structure of following tetrapeptide.

Gly—Tyr—Leu—Ala

c) How unsaturated fatty acids acts as precursor? Explain with suitable example.

d) What are Zymogens? Give its role with suitable example.

Q2) a) Explain in detail the process of gluconeogenesis. **[10]**

b) α-helix and β pleated structures of protein are regular repeating structures. Explain. **[10]**

Q3) Give the following reactions : **[20]**

a) Edman's degradation.

b) Ninhydrin.

c) Carboxypeptidase.

d) FDNB.

P.T.O.

Q4) a) What are allosteric enzymes? Give its importance with suitable example. **[10]**

b) Explain the process of detoxification of ammonia. **[10]**

Q5) a) Describe in detail the carnetine shuttel. **[10]**

b) What is transamination? Give intermediates and significance of transamination. **[10]**

Q6) Explain in detail Inosine mono phosphate pathway. **[20]**

Q7) a) What is recombinant DNA technology? Give its application for betterment of human being. **[10]**

b) Explain the structure and importance of glutamate dehydrogenase complex. **[10]**

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

a) Active site determination.

b) Deamination of threonine.

c) Purine and pyrimidine degradation.

d) Action of uncouplers.

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Total No. of Questions : 8] **[Total No. of Pages : 2**

P986

[3724]-102

M.Sc. (Sem. - I)

ZOOLOGY

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) ***Draw neat diagrams wherever necessary.***

SECTION - I

A) Genetics

Q1) a) Highlight the salient features of sex-linked inheritance. How can one conclude that albinism is an autosomal trait and that red-green colour blindness is a sex-linked trait?

b) Distinguish between dominant and recessive epistasis.

Q2) a) What is 'lac' operon? How do negative and positive control work on 'lac' operon?

b) Give major contrasting features of qualitative and quantitative traits with suitable examples.

Q3) Explain the principle and describe the applications of the followings :

a) Microarray analysis b) PCR

Q4) a) In a test cross between a heterozygous F_1 Drosophila female +++/cu ss sr and a homozygous male cu ss sr/cu ss sr for three recessive genes [curled (cu), spineless (ss), striped (sr)], the F_2 progeny results were :

+	+	+	=	430	+	+	sr	=	16
cu	ss	sr	=	452	cu	ss	+	=	17
+	ss	sr	=	45	+	ss	+	=	1
cu	+	+	=	38	cu	+	sr	=	1

Deduce a linkage map for these loci.

P.T.O.

b) A sample of 1000 hypothetical persons in the United States showed the following distributions of blood groups :

A - 450, B - 130, AB - 60, O - 360.

Calculate the frequencies of alleles I^A, I^B and I^O.

SECTION - II

B) English for Scientists

Q5) a) Mention the common errors in written and spoken presentation. Explain any two with examples.

b) Write a note on 'Title designing and key words'.

Q6) a) What are the parts involved in the planning of Project Work?

b) Give the significance of tabular data in the text of a scientific paper.

Q7) a) How to write the 'Discussion' part of a scientific paper?

b) What is meant by 'Survey of Literature'? Mention its importance in defining the research problem.

Q8) Attempt any four of the following :

a) Mention the features of precis writing.

b) Explain any five proof correction symbols and their use. Make use of your own sentences.

c) Write a note on the significance of 'hypothesis', in research work.

d) Write a letter to the Editor of a journal, requesting for reprints of your own published paper.

e) Give any five abbreviations with their full forms.

f) Explain the importance of measurements in Materials and Methods.

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Total No. of Questions : 8] **[Total No. of Pages : 3**

P987

[3724]-103

M.Sc. (Sem. - I)

ZOOLOGY

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 books.***
2) ***Answer any two questions from each section.***
3) ***All questions carry equal marks.***
4) ***Draw neat labelled diagrams wherever necessary.***

SECTION - I

A) Freshwater Zoology

Q1) Describe diagnostic features and life cycles of temporary rainwater pool animals. **[20]**

Q2) Describe adaptations for respiration & locomotion in freshwater insects. **[20]**

Q3) Describe various protective adaptations, food and feeding habits of freshwater protozoans. **[20]**

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

a) Role of pH in freshwater.

b) Economic importance of snails.

c) Life cycle of an Anuran.

d) Biomagnification in aquatic ecosystem.

e) Freshwater reptiles.

P.T.O.

SECTION - II

B) Statistical Methods

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

i) Class-frequency.

ii) Class-width.

iii) Class-mark.

b) The following data obtained blood sugar count of 125 patients.

Blood sugar	80-100	100-120	120-140	140-160	160-180
No. of patients	30	35	25	20	10

Find the mean and standard deviation of above distribution. **[10]**

c) Consider a family with 3 children. Assume that each child each as likely to be a boy as it is to be a girl. Find the probability that the family having at least two of the children are boys. **[4]**

Q6) a) Explain the following with suitable illustration. **[6]**

i) Sample space.

ii) Elementary event.

iii) Complement of an event.

b) For the following data of height X (in cms.) and weight Y (in kgs.) of 8 persons given below.

X	150	154	148	152	158	151	155	156
Y	52	58	50	55	64	53	60	62

Fit a regression equation of Y on X. Also estimate weight of a person whose height is 160 cms. **[10]**

c) Explain in brief "Scatter diagram". **[4]**

Q7) a) Explain t-test for testing a population mean. **[6]**

b) Genetic theory states that children having parents of blood type M and N will always be one of the three types M, MN, N in the ratio of 1 : 2 : 1. A report states that out of 300 children of above type, 70 were found to be of type M, 145 were of type MN and the remaining of type N. Whether it agrees with the theory, test at 5% level of significance. **[8]**

c) Define regression coefficients and state its properties. **[6]**

Q8) a) It is observed that 3 out of 15 female $B_6C_3F_1$, mice are exposed to liver tumor. What is probability that in a sample of 8 mice, 2 to 4 mice will be exposed to liver tumor? **[4]**

b) The data on hatching mass (g) and snout-length (mm) in wall lizards after eggs were incubated at 32° C is given below.

Length :	23.8	22.2	23.6	23.4	23
Mass :	0.25	0.32	0.27	0.23	0.28

Compute coefficient of correlation of length and mass and comment on it. **[10]**

c) Describe test procedure to test equality of population proportions. **[6]**

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Total No. of Questions : 8] **[Total No. of Pages : 2**

P988

[3724]-201

M.Sc. (Sem. - II)

ZOOLOGY

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 wherever necessary.***

SECTION - I

A) Developmental Biology

Q1) Describe the process of recognition of egg by sperm & add a note on molecular strategy to ensure monospermy.

Q2) What is neural competence? Describe the molecular signalling during neural induction.

Q3) Describe in detail the pattern formation in Drosophila.

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

a) Regulation of sperm motility.

b) Organizers in frog.

c) Fate maps in chick embryo.

d) Programmed cell death.

P.T.O.

SECTION - II

B) Comparative Animal Physiology

Q5) Explain the structure and dynamics of mammalian heart.

Q6) Explain the various theories of muscle contraction.

Q7) What is osmolarity? Explain the osmoregulation in marine animals.

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

a) Oxygen dissociation curve.

b) Dietary requirements in mammals.

c) Counter current multiplier hypothesis.

d) Poikilothermy.

e) Chemistry & functions of thyroid hormone.

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Total No. of Questions : 8] **[Total No. of Pages : 2**

P989

[3724]-202

M.Sc.

ZOOLOGY

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 the right indicate full marks.***

SECTION - I

A) Molecular Biology

Q1) a) What is Cot Curve and TM ? Give its significance. **[10]**

b) Explain the structure of DNA given by Watson & Crick. **[10]**

Q2) Explain the process of transcription by RNA Polymerase II. **[20]**

Q3) a) What is DNA repair? Discuss SOS repair. **[10]**

b) Describe structure of Nucleosomes. **[10]**

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

a) Use of mitochondrial DNA in phylogenetic analysis.

b) Post transcriptional modification.

c) HUGO.

P.T.O.

SECTION - II

B) Cell Biology

Q5) Describe nuclear pore complex and explain its role in nucleo-cytoplasmic interaction. **[20]**

Q6) Give structure and function of lysosomes. **[20]**

Q7) Write short notes on any four : **[20]**

a) Protein import in mitochondria.

b) G-proteins.

c) MPF.

d) Go phase.

e) Molecular organisation of flagellum.

f) Structure and function of peroxisomes.

Q8) Describe structure and functions of Endoplasmic reticulum. **[20]**

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Total No. of Questions : 12] **[Total No. of Pages : 2**

P990

[3724]-203
M.Sc.
ZOOLOGY
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) Explain the following : **[20]**

a) Sedimentation coefficient.
b) β-particles.
c) An ion exchanger.
d) Partition chromatography.
e) Isoelectro focusing.

Q2) a) Describe the various methods of protein sequencing. **[10]**

b) How will you characterize proteins with the help of PAGE and SDS PAGE? **[10]**

Q3) a) Explain the basic theory of ultracentrifuge. And add a note on its application. **[10]**

b) State beer's-Lambarts Law. Give the working of spectrophotometer. **[10]**

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

a) Manometry techniques.
b) Use of isotopes in biology.
c) HPLC.

P.T.O.

OR

A) Ichthyology

Q5) Give classification of Cyclostomata and Chondrichthytes with diagnostic characters. **[20]**

Q6) Describe the role of fat and swimbladder in buoyancy mechanism in fishes. **[20]**

Q7) Describe in detail the organization of central nervous system in fishes and add a note on chemoreceptors in fishes. **[20]**

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

a) Lateral line system.

b) Scales in fishes.

c) Functions of the pituitary gland.

d) Parental care in fishes.

SECTION - II

B) Endocrinology

Q9) Explain in detail various gastrointestinal hormones co-ordinating the process of digestion. **[20]**

Q10) a) Explain role of pancreatic hormone in regulation of carbohydrate metabolism. **[10]**

b) Explain role of hormones in ca-metabolism. **[10]**

Q11) Explain signal transduction cascade with reference to hormonal action. **[20]**

Q12) Write short notes on any two : **[20]**

a) ACTH

b) Renin-angiotensin complex.

c) Moulting in crustacean.

d) Steroid hormone.

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

P991

[3724]-301
M.Sc. - II (Sem. - III)
ZOOLOGY
ZY-311 : Entomology - I

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 and explain why they are proove as most successful group amongst other animals.

Q2) Describe the structure of thorax of typical insect. Add a note on modification of wings.

Q3) Describe the structure of head capsule of a generalised insect with respect to cranial sutures and areas. Add a note on mandibulate type of mouth parts.

Q4) Write the taxonomical characters of insect orders with atleast two examples from two families (any four) :

a) Orthoptera
b) Odonata
c) Coleoptera
d) Collembola
e) Isoptera

Q5) Describe the anatomy of alimentary canal of any orthopteroid insect and compare it with that of any sap sucking insects.

Q6) Give an account of excretory organs in insects.

Q7) Describe the structure and function of insect heart. Add a note on haemocytes.

Q8) Write short notes on (any four) :

a) Endocrine glands.
b) Cryptonephridium.
c) Types of antennae.
d) Modification of insect legs.
e) Wing coupling apparatus.

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Total No. of Questions : 8] **[Total No. of Pages : 2**

P991

[3724]-301

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

ZOOLOGY

ZY-312 : Genetics - 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 labelled diagrams wherever necessary.***

Q1) a) Discuss how random genetic drift can bring about changes in allele frequency? How does it influence evolutionary processes?

b) Define 'inbreeding coefficient' and discuss how genetic relationships can be measured?

Q2) Explain the genetic basis of phenotypic variance generally found associated with quantitative traits. How can one determine the extent of role played by genes and the contribution of environmental factors? Add a note on heritability.

Q3) Enlist various applications of following techniques :

a) PCR

b) RFLP

c) FISH

d) Flow sorting

Q4) Write notes on :

a) Applications of Hardy-Weinberg principle in evolutionary biology.

b) Assortative mating.

P.T.O.

Q5) Discuss how selection strategies involving heterozygote superiority can lead to balancing selection. Add notes on 'selection coefficient'.

Q6) Distinguish between 'directional' and 'disruptive' mode of selection. Give suitable examples of each.

Q7) Enlist and explain different techniques used for gene localization on chromosomes.

Q8) Give an overview of the current status of 'gene therapy'.

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

P991

[3724]-301
M.Sc. - II (Sem. - III)
ZOOLOGY
ZY-313 : Physiology - I

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) Describe the various problems of Sea living animals. Add a note on deep sea hydrothermal vents with examples.

Q2) Explain the mechanism of temperature compensation in poikilotherms in extreme high and low environment.

Q3) What is biological clock? Describe the circardian and tidal rhythms with proper examples.

Q4) What is bioluminiscence? Explain the structure of luminiscent organs and molecular mechanism of bioluminiscence.

Q5) What is resting membrane potential? Explain various factors affecting it and add a note on Goldman-Hodkin-Katz potential.

Q6) Give an account of organs of excretion and urine formation in various vertebrates.

Q7) What is buoyancy? Explain the strategies for floating.

Q8) Write notes on :

a) Renal regulation of acid-base balance.

b) Ion channels.

c) Acclimation.

d) Electroorgans.

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Total No. of Questions : 20] **[Total No. of Pages : 3**

P992

[3724]-302

M.Sc. (Sem. - III)

ZOOLOGY

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.***

ZY-321 : Immunology

Q1) How does cell mediated response offer protection from pathogens?

Q2) Explain the role of blood antigens in transplantation.

Q3) Explain Autoimmune diseases with suitable examples.

Q4) Write short notes on any two :

a) Monoclonal Antibodies.

b) Principle and applications of Radio Immuno Assay.

c) Immunological tolerance.

P.T.O.

ZY-322 : Environmental Biology

Q5) "Man is responsible for the changing climate". Discuss.

Q6) Explain the factors responsible for water pollution.

Q7) Why is environmental education essential?

Q8) Write short notes on :

a) Sustainable development.

b) Conservation of forests.

c) Global warming.

d) Desert ecosystem.

ZY-323 : Fundamentals of Systematics

Q9) What is taxonomy? Explain the hierarchy of categories and higher taxa.

Q10) Give an account of newer trends in taxonomy.

Q11) a) What is 'Biological species concept' of E-Mayr? Explain subspecies, sibling species and deme.

b) Describe taxonomic keys with their merits and demerits.

Q12) Write short notes on (any four) :

a) Preservation of animals for taxonomy.

b) Zoological nomenclature.

c) Curreting process and identification.

d) Artificial and Natural classification.

e) Phylogeography.

ZY-324 : Aquaculture

Q13) Describe various types of fish ponds and explain their types, preparation and maintenance.

Q14) Describe various fishing methods. Add a note on their preservation and processing.

Q15) a) Explain the methods of fish harvesting.

b) Give the ecological and economical relevance of aquaculture.

Q16) Write short notes on :

a) Spawning.

b) Rearing of oysters.

c) Habit and habitat of Prawns.

d) Inland fishery.

ZY-325 : Insect Ecology

Q17) Explain the impact of biotic and abiotic factors on insect development.

Q18) a) Explain the mechanism of thermoregulation in insects.

b) Describe the evolution of insects in soil.

Q19) Define phytophagous insects. Describe their modes of feeding and add a note on their host specificity.

Q20) Write short notes on :

a) Evolution of insect parasite.

b) Insect predators of vertebrates.

c) Predacious insects.

d) Soil insects.

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Total No. of Questions : 12] **[Total No. of Pages : 2**

P993

[3724]-303

M.Sc. (Sem. - III)

ZOOLOGY

ZY-331 : Parasitology

ZY-332 : Insect Physiology & Biochemistry

ZY-334 : Genetic Toxicology

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 answer book.***

SECTION - I

ZY-331 : Parasitology

Q1) Describe the morphology, life cycle, pathogenicity, prophylaxis & treatment of any two parasite.

a) Trypanosoma.

b) Schistosoma.

c) Echinococcus.

Q2) Explain in details the genome size, diploid and haploid stage of meiosis in plasmodium.

Q3) a) Describe the different mode of parasitic transmission.

b) Chromatin diminution in Ascaris.

Q4) Write short notes on any two :

a) VSG (Variable surface glycoproteins).

b) ELISA.

c) Transmission.

d) Dracunculus sp.

P.T.O.

SECTION - II

ZY-332 : Insect Physiology & Biochemistry

Q5) Describe the structure, physiology and functions of flight muscle in insects.

Q6) Give an account of Physico-chemical properties of haemolymph in insects. Add a note on haemocytes.

Q7) Explain the role of Extrachromosomal enzymes in insecticide degradation and detoxification.

Q8) Write short notes on any two :

a) Role of endocrine glands in insect moulting.

b) Physiology of Excretion and osmoregulation in insects.

c) Structure and function of insect integument.

SECTION - III

ZY-334 : Genetic Toxicology

Q9) Explain the mechanism of chemical mutagenesis.

Q10) What are chromosomal aberrations? Explain the various types of these aberrations with suitable examples.

Q11) Explain the cytogenetic methods used to assess the genotoxic potential of a test compound.

Q12) a) Explain the mechanism by which an oncogene can be activated.

b) Explain the scope and importance of genetic toxicology.

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

P994

[3724]-401

M.Sc. - II

ZOOLOGY

ZY-411 : Entomology - II

(Old & New)

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) What is spermatogenesis? Write an account of spermatogenesis in insects.

Q2) Describe the types of ovarioles and give an account of oogenesis.

Q3) Describe in detail Post embryonic development in Hemimetabolous insects.

Q4) Write notes on <u>any two</u> of the following :

a) Sex determination in insects.
b) Imaginal discs in insects.
c) Paedogenesis.
d) Viviparity.

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

Q6) Give an account of merits and demerits of 2^{nd} & 3^{rd} generation pesticides.

Q7) Describe Pesticide hazards and their antidotes with suitable examples.

Q8) Write notes on <u>any two</u> of the following :

a) Integrated Pest Control and its importance.
b) Entomophagous insects.
c) Contact poison.
d) Pesticides of botanical origin.

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

P994

[3724]-401

M.Sc. (Sem. - IV)

ZOOLOGY

ZY-412 : Genetics - II

(Old & New)

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

Instructions to the candidates :

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

Q1) What is pedigree analysis? Explain how are pedigree charts used in human genetics.

Q2) Describe the genetics of any five human metabolic diseases.

Q3) Explain the importance of MHC Laws of humans in medical practice.

Q4) Describe the mechanism of Dosage compensation in man. How does it differ from that in Drosophila?

Q5) Explain the various banding techniques of chromosomes and their clinical importance.

Q6) Describe different techniques used in Physical Mapping.

Q7) 'T Cell Receptors' exhibit a great amount of diversity — Justify.

Q8) What is the difference between Hereditary cancer and a sporadic cancer? Explain how progression through the cell-cycle is regulated by the phosphorylation of the retinoblastoma protein P^{RB}?

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Total No. of Questions : 7] **[Total No. of Pages : 1**

P994

[3724]-401
M.Sc.
ZOOLOGY
ZY-413 : Physiology - II
(Old & New)

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 functions and composition of blood, and add a note on haematopoiesis.

Q2) Explain the anatomy of heart. Comment on electrical activity of the pace makers and add a note on electrocardiography.

Q3) What is respiration? Explain in detail the transport of Oxygen and Carbon-di-oxide.

Q4) What is nutrition? Explain the components of the digestive system and add a note on mechanism of digestion.

Q5) a) Explain the structure and function of neuron and add a note on saltatory conduction.

b) Explain the physiology of hearing and equilibrium.

Q6) Explain the structure of skeletal muscle and molecular basis of its contraction. Add a note on properties of skeletal muscle.

Q7) Write notes on :

a) Physiology of vision.

b) Gustatory receptors.

c) Gastrointestinal hormones.

d) Neurotransmitters & Neuropeptides.

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Total No. of Questions : 20] **[Total No. of Pages : 4**

P995

[3724]-402

M.Sc.

ZOOLOGY

(Old & New)

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) ***Answers to the two sections should be written in separate answer books.***
4) ***All questions carry equal marks.***

SECTION - I

ZY-421 : Animal Tissue Culture

Q1) a) Give an account of sterilization practices in animal tissue culture.

b) Enlist the components required in preparation of tissue culture media and give their significance.

Q2) Explain the biochemical and genetic characterization of cell lines.

Q3) a) Comment on the procedure of generating insect cell-lines.

b) What is karyotyping? Give its significance.

Q4) Write notes on any two :

a) Cell repositories.

b) Organ culture.

c) Lymphocyte culture.

P.T.O.

SECTION - II

ZY-422 : Pollution Biology

Q5) Define Air pollution. Describe its sources, impact and control measures.

Q6) a) Explain in brief 'Biosphere' and add a note on 'Hydrosphere'.

b) Describe various methods of monitering Noise pollution.

Q7) Give an account of various types of pollution and the pollutants.

Q8) Write notes on :

a) Biofouling.

b) Sources of Pesticide Pollution.

c) Green house effect.

d) Mineral resource.

SECTION - III

ZY-423 : Marine Biology

Q9) Give an account of subdivisions of marine environment with appropriate illustrations.

Q10) Describe an estuary with its classification and add a note on its origin.

Q11) Describe various marine resources with appropriate examples.

Q12) Write notes on :

a) Food cycles.

b) Control measures of boring animals.

c) Culturing marine organisms.

d) Littoral zone.

SECTION - IV

ZY-424 : Bacterial and Phage Genetics

Q13) Explain the following :

a) Recombinant DNA.

b) Drug resistance.

c) Complementation.

d) S-R variation.

Q14) a) What are T phages? Discuss in brief the replication of T_4-DNA.

b) What is chromosome mapping? Explain with suitable example.

Q15) What are bacteriophages? How are they classified? Differentiate between the life cycle of a DNA and RNA phage.

Q16) Write notes on (any two) :

a) Overlapping genes.

b) Cistron.

c) Restricted transduction.

SECTION - V

ZY-425 : Medical Entomology

Q17) Describe the causative agent, life cycle, pathogenicity and control measures of following diseases.

a) Bartonellacea.

b) Relapsing fever.

c) Dengue fever.

d) Rickettsia.

Q18) Describe the role of insects in human health.

Q19) Explain the medical importance of orders Diptera and Siphonoptera.

Q20) Write short notes on :

a) Silver fish.

b) Bubonic plague.

c) Veternary pests.

d) Lishmaniasis.

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Total No. of Questions : 16] **[Total No. of Pages : 3**

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[3724]-403

M.Sc.

ZOOLOGY

(Old & New)

ZY-431 : Physiology of Mammalian Reproduction

ZY-432 : Comparative Invertebrate Histology & 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 diagrams must be drawn wherever necessary.***

SECTION - I

ZY-431 : Physiology of Mammalian Reproduction

Q1) a) What is implantation? Explain in brief delayed implantation in mammals.

b) Discuss Oestrous cycle in mammals.

Q2) a) What are contraceptive devices? Mention its role in control of reproduction.

b) Give an account on various hormones involved in maintenance of pregnancy.

Q3) Write in detail the structure, function and hormonal regulation of mammary gland during lactation.

P.T.O.

Q4) Write short notes on any two :

a) Artificial insemination.

b) Genetic disorders in reproduction.

c) Breeding patterns in animals.

d) Testicular hormone.

SECTION - II

ZY-432 : Comparative Invertebrate Histology and Histochemistry

Q5) What is fixative? Explain formaldehyde as a fixative and add a note on the procedure for fixing tissues.

Q6) Explain the characters, types and marks of identification of epithelial tissue.

Q7) What is histochemical staining? Explain the principle and histochemical method of detection of mucopolysaccharides.

Q8) a) Explain the histochemical detection of alkaline phosphatase.

b) Write a note on Sudan black and its application in histochemistry.

SECTION - III

ZY-433 : Biodiversity Assessment

Q9) Explain in detail the classification of classmammalia upto order level with suitable examples.

Q10) Define conservation. State the objectives of conservation and describe in detail the strategies of forest conservation.

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

Q12) Write short notes on (any four) :

a) Parasitism.

b) Zoogeographical realms.

c) Ex situ conservation.

d) Characters of Echinodermata.

e) Legal aspects of wildlife management.

SECTION - IV

ZY-435 : Apiculture

Q13) Describe in detail the viral, bacterial and fungal diseases in honey bees.

Q14) Give an account of composition and economic importance of honey and bees wax.

Q15) Describe Social Organisation in honey bees and state the role played by each caste.

Q16) Write notes on :

a) Bee pollination.

b) Seasonal management - winter of a colony.

c) Life cycle of honey bees.

d) Nuptial flight.

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