

Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

**P2822**

**[5029] - 11**

**M.Sc. - I**

**ZOOLOGY**

**ZY - 101 : Biochemistry**

**(2008 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 glycosidic bond. Give its importance in structural polysaccharide with suitable examples. **[10]**

b) What is N - terminal? Give any two methods for its determination. **[10]**

**Q2)** a) Give the various levels of proteins structure and give the importance of non - covalent forces involved in stability of protein structure. **[10]**

b) Discuss the significance of L - B equation. **[10]**

**Q3)** a) What are anaplerotic and amphibolic reactions. Discuss with suitable examples. **[10]**

b) Discuss the mechanism of oxidative phosphorylation and add a note on action of uncouplers. **[10]**

**Q4)** Discuss in detail the process of gluconeogenesis and give its significance. **[20]**

**P.T.O.**

**Q5)** Write notes on. **[20]**

- a) Coenzyme
- b) Chemistry of triglyceride
- c) Dehydrogenase complex
- d) Structure and function of fatty acid

**Q6)** Discuss in detail TCA cycle. Give its amphibolic nature. **[20]**

**Q7)** a) Discuss the transport and detoxification of ammonia in liver. **[10]**

b) Give the synthesis of deoxyribonucleotide synthesis. **[10]**

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

- a) Transamination
- b) Role of branching and debranching enzymes
- c) Purine and pyrimidine degradation
- d) Enzyme isoforms



Total No. of Questions :8]

SEAT No. :

P2823

[Total No. of Pages :2

[5029] - 12

M.Sc. - I

ZOOLOGY

ZY - 102 : (A) Genetics

ZY 102 (B) English for Scientists

(2008 Pattern) (Semester - I)

*Time : 3 Hours]*

*[Max. Marks :80*

*Instructions to the candidates:*

- 1) *Answer any two questions from each section.*
- 2) *Answer 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 - 102 : A) Genetics**

**Q1)** Explain the concept of epistasis and hypostasis with suitable examples.

**Q2)** What is quantitative trait? Explain the inheritance of quantitative traits in human with suitable examples.

**Q3) a)** Explain the fine structure of gene with reference to Benzer's work.

b) A hybrid  $F_1$  female Drosophila,  $b + V / + PV$ . Test crossed with  $b Pv$  male, gave the following count of progeny.

- |                  |                  |
|------------------|------------------|
| 1. $b + v = 369$ | 5. $+ p + = 432$ |
| 2. $b p + = 41$  | 6. $+ p v = 53$  |
| 3. $+ + v = 36$  | 7. $b p v = 02$  |
| 4. $b + + = 65$  | 8. $+ + + = 02$  |

( $b$  = black body;  $p$  = purple eyes;  $v$  = vestigial Wings) Construct a chromosome map from the above data.

**P.T.O.**

**Q4)** Write notes on: (any two)

- a) Restriction enzymes
- b) Hardy weinberg's law and its application
- c) DNA sequencing

## **SECTION - II**

### **ZY - 102 : B) English for Scientist**

**Q5)** Explain outline of scientific paper. Explain how it is different from project writing.

**Q6)** How to write the section “ Materials and methods” of a scientific paper.

**Q7)** Write the qualities of good “title” for scientific paper. Explain with suitable examples.

**Q8)** Write short notes (any two).

- a) Gally proof and proof reading
- b) Jorgans and abbreviations
- c) Key words and their importance
- d) Styles of citation



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 3

**P2824**

**[5029]-13**

**M.Sc.**

**ZOOLOGY**

**ZY -103 :(A) Freshwater Zoology**

**(B) Statistical Methods**

**(Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

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

**SECTION - I**

**A) Freshwater Zoology**

**Q1)** Describe various protective adaptations of fresh water animals. **[20]**

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

**Q3)** Give an account of economic importance of freshwater mollusc. **[20]**

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

- a) Fairy shrimps.
- b) Adaptations in freshwater reptiles.
- c) Ephemeral water bodies.
- d) Lotic biome
- e) Role of dissolved gases in water.

**P.T.O.**

## SECTION - II

### B) Statistical Methods

- Q5) a)** Explain the following terms: **[6]**
- i) Mutually exhaustive events.
  - ii) Occurrence of both the events at a time
  - 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 correlation and interpret the values of correlation coefficient  $r=0$ ,  $-1$ ,  $+1$ . **[4]**

- Q6) a)** Define normal distribution and state the properties of it. **[6]**
- b) Compute Karl Pearson's coefficient of correlation between age (in years) and blood pressure in (mm/Hg.) for 7 individuals. Comment on the result. **[10]**

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

- c) Define mode, Describe the procedure how it is obtained for individual observations & discrete frequency distribution. **[4]**

- Q7)** a) Explain the chi-square test of goodness of fit. **[10]**
- b) In a clinical trial of oral ant diabetic agent Repaginate, conducted on 13 patients, following are the values of blood glucose in mg % before and after the medication. **[10]**

Before medication	180	210	220	250	190	200	170	300	330	280	230	245	215
After medication	160	140	180	140	160	140	120	170	190	165	155	135	112

Test whether the drug Repaginate is effective? use 5% level of significance.

- Q8)** a) Define the following terms: **[10]**
- i) Null hypothesis
  - ii) Alternative hypothesis
  - iii) Type I Error
  - iv) Type II Error
- b) A Basal metabolic rates (BMR, Calories per minute after fasting) follows normal distribution with mean 1.6 and variance unity.  
Find i) Probability that BMR will lie between 1.3 & 1.9.  
ii) Probability that BMR will less than 1.2. **[10]**



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

**P2825**

[5029] - 21

M.Sc.

**ZOOLOGY**

**ZY - 201 : (A) Developmental Biology**

**ZY - 201 : (B) Comparative Animal Physiology**

**(Semester - II) (2008 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**

**ZY - 201 : (A) Developmental Biology**

**Q1)** What is neural competence? Describe the molecular signalling during neural induction.

**Q2)** Explain the structure of tail fibre complex and comment upon the regulation of sperm locomotion.

**Q3)** Describe in detail the pattern formation in *Drosophila*.

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

- a) Hayflick's experiment on cell - ageing
- b) Mesoderm induction in *Xenopus*
- c) Fate maps in chick embryo
- d) Lampbrush chromosomes

***P.T.O.***



## **SECTION - II**

### **ZY - 201 : (B) Comparative Animal Physiology**

**Q5)** What are blood pigments? Explain the role of haemoglobin in oxygen transport.

**Q6)** What are hormones? Explain the mechanism of hormone action.

**Q7)** a) Explain the various modes of nitrogen excretion.

b) What are sense organs? Classify them and comment on the function of each one.

**Q8)** Write short notes. (any four)

a) Structure of skeletal muscle

b) Myogenic heart

c) Hypo - osmotic regulators

d) Hibernation

e) Ascorbic acid synthesis



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

**P2826**

[5029] - 22

M.Sc.

**ZOOLOGY**

**ZY - 202 : A) Molecular Biology**

**B) Cell Biology**

**(2008 Pattern) (Semester - 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) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

**SECTION - I**

**ZY - 202 : (A) Molecular Biology**

**Q1)** Explain in detail the mechanism of protein synthesis in eukaryotes. **[20]**

**Q2)** a) Explain the initiation of transcription in prokaryotes. **[10]**

b) Explain the organization of chromatin. **[10]**

**Q3)** Explain in detail the prokaryotic DNA replication. Add a note on its semiconservative nature. **[20]**

**Q4)** Write notes on the following. **[20]**

- a) Z - DNA
- b) C value paradox
- c) Polyadenylation
- d) Transposons

***P.T.O.***

## **SECTION - II**

### **ZY - 202 : (B) Cell Biology**

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

**Q6)** Describe the genetic system and mechanism of protein import in mitochondria. **[20]**

**Q7)** What is cell cycle? Give the methods of analysis of various phases of cell cycle. **[20]**

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

- a) Cell fusion and electroporation
- b) G - proteins
- c) Glyoxysomes
- d) Intermediate filaments



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :3

**P2827**

[5029] - 23

M.Sc.

**ZOOLOGY**

**ZY - 203 : A) Biochemical Techniques**

**OR**

**A) Ichthyology**

**ZY - 203: 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 book.*
- 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 do you mean Matrix? Give the characteristics of various support matrix.
- b) What is sequencing? Describe any one method of DNA sequencing.
- c) Explain the term ultra centrifugation.
- d) State the Beer - Lamberts law and give its importance.

**Q2)** a) Give the principle, choice of ion exchanger and application of Ion exchange chromatography. **[10]**

b) Give the principle, working and application of Agarose gel electrophoresis. **[10]**

**Q3)** a) Explain the working and importance of warburg's appratus. **[10]**

b) Explain the working and application of Gm counter. **[10]**

***P.T.O.***

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

- a) Gc
- b) Gel chromatography
- c) Preparative centrifugation
- d) Use of radio isotope
- e) HPLC

OR

**SECTION - I**

**A) Ichthyology**

**Q1) Describe in detail the typical structure of teleost gill and role of air bladder in respiration. [20]**

**Q2) Describe the structure of skin and colouration in fishes and add a note on its ecological significance. [20]**

**Q3) What is excretion? Describe the role of kidney in osmoregulation and nitrogen (Ammonia, urea, TMAO) excretion. [20]**

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

- a) Eye ball muscles of scoliodon
- b) Parental care in fishes
- c) Corpuscles of stannius
- d) Buoyancy mechanism in fishes

**SECTION - II**

**B) Endocrinology**

**Q5) Explain in detail the role of gastrointestinal hormones in the process of digestion [20]**

**Q6)** a) Explain the renin - angiotensin complex. [10]

b) Explain the role of hormones in protein metabolism. [10]

**Q7)** a) Explain the role of 'X' & 'Y' organ in crustacea. [10]

b) Explain the role of pituitary and pineal glands in control of chromatophores. [10]

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

a) Hormone receptors

b) STH

c) Hormonal regulation of Yolk Synthesis

d) Glucocorticoids



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :5

**P2828**

**[5029] - 31**

**M.Sc. - II**

**ZOOLOGY**

**ZY - 311 : Entomology - I**

**(2008 Pattern) (Semester - III)**

*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 origin of insects giving different theories.

**Q2)** Describe the morphology and structure of alimentary canal of typical insect and compare it with any fluid feeding insect.

**Q3)** Give the distinguishing characters of following insect orders with at least two examples from two families.

- a) Lepidoptera
- b) Coleoptera
- c) Thysanoptera
- d) Dermaptera
- e) Heteroptera

**Q4)** Describe the structure and give functions of endocrine glands found in insects.

**Q5)** Describe the structure and functions of excretory organs in insects.

**Q6)** Describe the morphology of insect thorax and add a note on leg modifications.

**Q7)** Describe morphology of head capsule of insect. Add a note on various types of insect antennae.

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

- a) Types of haemocytes
- b) Pulsatile organ
- c) Eye of insect
- d) Proventriculus
- e) Tentorium



**P.T.O.**

Total No. of Questions :8]

**P2828**

**[5029] - 31**

**M.Sc. - II**

**ZOOLOGY**

**ZY - 312 : Genetics - I**

**(Semester - III) (2008 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)** Differentiate between the following:

- a) Orthologous gene and Paralogous gene. **[5]**
- b) Random mating and Inbreeding. **[5]**
- c) Gene penetrance and Gene expressivity. **[5]**
- d) Allele frequency and Genotype frequency. **[5]**

**Q2)** a) what is genetic equilibrium? Explain Hardy - weinberg's law. **[10]**

- b) What is the mathematical expression of the genetic equilibrium for the gene with two alleles? Is this statistical distribution the same as phenotype distribution. **[10]**

**Q3)** Write notes on the following: **[20]**

- a) Natural selection
- b) Genetic death
- c) Genetic mutation
- d) Continuous variation



**Q4)** What do you mean by fitness? What is the fitness of the organism that dies before age of reproduction? What is the fitness of an organism that is sterile.**[20]**

**Q5)** “Mutation and Migration brings new allele into population”. Justify the statement.  
**[20]**

**Q6)** What is PCR? Describe the procedure and components required for successful PCR. **[20]**

**Q7)** How is RFLP used in genetics? Describe with suitable example. **[20]**

**Q8)** What do you mean by gene therapy? What are the different types of vectors used in gene therapy? **[20]**



Total No. of Questions :8]

**P2828**

[5029] - 31

M.Sc. - II

**ZOOLOGY**

**ZY - 313 : Physiology - I**

**(2008 Pattern) (Semester - III)**

*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 mechanism of temperature compensation in poikilotherms in fluctuating environmental conditions.

**Q2)** What is osmoregulation? Explain the mechanism of osmoregulation in aquatic animals.

**Q3)** a) Describe voltage gated Na-K pump.  
b) Explain the dynamics of semi permeable membrane.

**Q4)** a) Explain metabolism in relation to low oxygen level.  
b) Explain the structure and function of electric organs in Torpedo.

**Q5)** Describe the physiological changes of internal environment during. Fluctuations. of External Environment in terrestrial animals.

**Q6)** a) Explain the structure and function of swim bladder in fish.  
b) Describe different types of gas floats with examples.

**Q7)** Explain the metabolic rate in relation to body size in birds and mammals.

**Q8)** Write notes on:

- a) Biochemical mechanism of bioluminescence in fly
- b) Anaerobic metabolism
- c) Hibernation
- d) Uricotelism



Total No. of Questions : 20]

SEAT No. :

[Total No. of Pages : 3

**P2829**

**[5029]-32**

**MSc.-II**

**ZOOLOGY**

**ZY-321 : IMMUNOLOGY**

**ZY-322: ENVIRONMENTAL BIOLOGY**

**ZY-323: FUNDAMENTALS OF SYSTEMATICS**

**ZY-324 : AQUACULTURE**

**ZY-325 : INSECT ECOLOGY**

**(Semester-III)(2008 Pattern)**

*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 two courses should be written in separate answer books.*
- 3) *Attempt any two questions from each optional course.*
- 4) *All questions carry equal marks.*

ZY- 321 : Immunology

**Q1)** What is humoral immunity? Explain the antibody mediated response to fight against pathogens.

**Q2)** Explain the molecular basis of generation of antibody diversity.

**Q3)** What is MHC? Discuss its role in antigen processing and presentation.

**Q4)** Write notes on any two:

- a) Monoclonal antibodies.
- b) Immunoelectrophoresis.
- c) T-cell receptors and their significance.

ZY-322 : Environmental Biology

**Q5)** What is ecosystem? Describe the energy flow in a typical ecosystem.

**Q6)** 'Man is responsible for climate change'. Discuss

**P.T.O**

**Q7)** Write an essay on 'Environmental education'.

**Q8)** Write notes on:

- a) Air pollution.
- b) Natural resources.

ZY-323 : Fundamentals of systematics

**Q9)** What is E-Mayr's 'Biological species' concept? Explain subspecies, sibling species and deme.

**Q10)** What is the hierarchy of categories? Describe the theories of biological classification.

**Q11)** Explain various taxonomic procedures for preparation of insect specimen for taxonomic work.

**Q12)** Write notes on (any 4):

- a) Cytotaxonomy
- b) ICZN
- c) Species
- d) Molecular systematics
- e) Taxonomic nomenclature

ZY-324 :(Aquaculture)

**Q13)** Describe in detail the process of natural and induced breeding in fishes.

**Q14)** What is pearl? Explain in detail the process of pearl formation. Add a note on harvesting of pearls.

**Q15)** What is fish pond? Describe types, preparation and maintenance of fish ponds.

**Q16)** Write short notes on:

- a) Lobster fishery
- b) Fish pathology

ZY-325 : Insect Ecology

**Q17)** Explain how biotic and abiotic factors control insect population.

**Q18)** Describe the evolution of entomophagy and add a note on parasitoids.

**Q19)** Describe the relationship between insects and vascular plants.

**Q20)** Write notes on:

- a) Soil insects
- b) Insect parasites of vertebrates



Total No. of Questions : 12]

SEAT No. :

[Total No. of Pages : 2

**P2830**

**[5029]-33**

**M.Sc.-II**

**ZOOLOGY**

**ZY-331 : Parasitology**

**ZY-332: Insect Physiology and Biochemistry**

**ZY-334 : Genetic Toxicology**

**(Semester-III)(2008 Pattern)**

*Time :3Hours]*

*[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 seperate answer books.*

**SECTION-I**

ZY 331 : Parasitology

- Q1)** Describe the morphology, life cycle, pathogenicity, prophylaxis and treatment of Echinococcus and Dracunculus.
- Q2)** Describe in detail the various prophylactic and control measures of parasites.
- Q3)** Define the immunodiagnostic assay and explain the principle use of immunodiffusion technique of agglutination test.
- Q4)** Write notes on (any four)
- a) Surface antigen diversity of plasmodium
  - b) Malaria drug resistance
  - c) Myiasis
  - d) Interspecific and strain variation in schistosoma.
  - e) Manipulation of host behaviour

**P.T.O**

## **SECTION-II**

ZY-332 : Insect physiology and Biochemistry

- Q5)** What is excretion? Describe the regulation of nitrogen excretion and water balance in insects.
- Q6)** a) Explain the structure of epicuticle.  
b) Explain the digestion and absorption of carbohydrate in insects.
- Q7)** What are haemocytes? Describe the types. Structure and functions of various haemocytes?
- Q8)** Explain the role of corpora cardiaca, corpora allata and ecdysal gland in insect metamorphosis.

## **SECTION-III**

ZY-334 : Genetic Toxicology

- Q9)** Explain the mechanism of chemical mutagenesis.
- Q10)** Describe the methods used to detect mutation in mammals and Drosophila.
- Q11)** a) Explain the biological end points of mutation  
b) Explain the various structural aberrations.
- Q12)** Write notes on any two:
- a) Importance of genetic toxicology  
b) DNA repair  
c) Carcinogenesis





Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :4

**P2831**

**[5029] - 41**

**M.Sc.-II**

**ZOOLOGY**

**ZY - 411 : Entomology - II**

**(2008 Pattern) (Semester - IV)**

*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)** Give a detail account of unusual type of development in insects.

**Q2)** Describe in detail the role of biological agents in pest control.

**Q3)** Describe 2<sup>nd</sup> and 3<sup>rd</sup> generation pesticides with their significance.

**Q4)** Write notes on (any two):

- a) Types of ovarioles
- b) Hadorn's expts.
- c) Vitellogenesis
- d) Regeneration in insects

**Q5)** Give an account of gastrulation in insects with suitable examples. Add a note on theories of gastrulation.

**Q6)** Describe growth in insects with the help of Dyar's law and Prizibram's rule.

**Q7)** Discuss economics of pest control.

**Q8)** Write notes on (any two):

- a) Ageing in insects
- b) Sex determination in insects
- c) Insect repellents
- d) Pesticide hazards



**P.T.O.**

Total No. of Questions :8]

**P2831**

**[5029] - 41**

**M.Sc. - II**

**ZOOLOGY**

**ZY - 412 : Genetics - II**

**(Semester - IV)(2008 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) How loss of mutation leads to development of Retinoblastoma?  
b) Explain the mutational events that lead to development of oncogenes from protooncogenes.
- Q2)** What are inheritance patterns? Add a note on x-linked inheritance pattern.
- Q3)** What are Recombinase Activating Gene(RAG) and Recombination Signal Sequence(RSS)? Explain their importance in generation of antibody diversity.
- Q4)** What is genetic counselling? How pedigree can serve as an important tool for a genetic counsellor.
- Q5)** Explain mechanism of x-inactivation in human beings.
- Q6)** Explain what is parametric and non-parametric analysis.
- Q7)** What is cell cycle? How cell cycle is genetically controlled?
- Q8)** How schizophrenia is genetically controlled? Add a note on importance of twin studies and adoption studies in schizophrenia.



Total No. of Questions :8]

**P2831**

**[5029] - 41**

**M.Sc.**

**ZOOLOGY**

**ZY - 413 : Physiology - II**

**(2008Pattern) (Semester - IV)**

*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 skeletal muscle. Add a note on proteins of muscle filaments and their functions.

**Q2)** What is sensory physiology? Explain the structure of ear and add a note on physiology of hearing and equilibrium.

**Q3)** What is respiration? Explain the mechanisms of transport of oxygen and CO<sub>2</sub>.

**Q4)** What are pace makers? Explain their function and add a note on anatomy of heart.

**Q5)** Explain the structure and function of nerve cell. Add a note on resting membrane potential and action potential.

**Q6)** a) Explain Calorimetry and BMR. Add a note on their significance.  
b) Explain the different components of blood.

**Q7)** a) Explain the role of peripheral receptors in respiration.  
b) Explain the impact of drugs and diseases on synaptic transmission.

**Q8)** Write notes on:

- a) Olfactory receptors
- b) Hypertension
- c) Gastrointestinal hormones
- d) Nutrients and their importance.



Total No. of Questions : 20]

SEAT No. :

**P2832**

**[5029]-42**

[Total No. of Pages : 4

**M.S.c**

**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)(2008 Pattern)**

*Time :3Hours]*

*[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) Describe the process of homogenization and trypsinization with reference to cell cultures.
- b) Describe various physical and chemical agents used for sterilization.
- Q2)** a) Explain in detail various ways of genetic characterization of cell lines.
- b) Describe the different advantages of insect cell culture.
- Q3)** a) Explain mechanical disaggregation of animal tissue. Add a note on primary culture.
- b) Discuss the merits and demerits of serum free media and serum containing media.

**Q4)** Write short notes:

- a) HEPA filter
- b) Application of animal tissue culture
- c) Cell subculture
- d) Lymphocyte culture

## **SECTION-II**

### **ZY-422 : Pollution Biology**

**Q5)** Describe the need and importance of pollution monitoring with respect to Noise pollution

**Q6)** Give an account of structure and function of Atmosphere with appropriate diagram.

**Q7)** Discuss the strategies that can be adopted for monitoring soil pollution.

**Q8)** Write notes on:

- a) Hydrosphere
- b) Eutrophication
- c) Pesticide pollution
- d) Ozone layer depletion

## **SECTION-III**

### **ZY-423 : Marine Biology**

**Q9)** Describe the benthic and pelagic zone and the animal diversity with appropriate examples.

**Q10)** Give an account of animal resources in a marine habitat.

**Q11)** Describe in detail the food cycles and food chain in marine ecosystem.

**Q12)** Write notes on:

- a) Subdivisions of marine environment.
- b) Structure of an estuary.
- c) Marine boring organism.
- d) Mineral resources

#### **SECTION-IV**

#### **ZY-424 : Bacterial and Phage Genetics**

**Q13)** Explain the following:

- a) Formation of  $\lambda$ dg/  $\lambda$ db transduction
- b) Intragenic and intergenic complementation

**Q14)** Comment on:

- a) Role of Cro, CI, CII, and CIII proteins in maintenance of lysogeny or causing lysis.
- b) Salient features of Transposons with suitable example.

**Q15)** Explain:

- a) Transformation process exhibited by Haemophilus species.
- b) Suppressor tRNAs and their significance.

**Q16)** Write notes on:

- a) Replication of overlapping genes.
- b) Mfr strains and their role in gene transfer.

#### **SECTION-V**

#### **ZY-425 : Medical Entomology**

**Q17)** Describe the important morphological features of Glossina sp., Tabanus sp. and Hippobosca sp. Elaborate on their role as a vector.

**Q18)** Describe the symptoms, pathogenecity and control measures of yaws, Relapsing fever and carrions disease.

**Q19)** Give an account of insects of veterinary importance with suitable examples.

**Q20)** Write notes on:

- a) Culex.
- b) Insects as food of other Organisms.
- c) Trypanosomiasis.
- d) Book lice.





Total No. of Questions : 16]

SEAT No. :

**P2833**

**[5029]-43**

[Total No. of Pages : 3

**M.Sc.**

**ZOOLOGY**

**ZY-431 :Physiology of Mammalian Reproduction**

**ZY-432:Comparative Invertebrate Histology and Histochemistry**

**ZY-433: Biodiversity Assessment**

**ZY-435 : Apiculture**

**(Semester-IV)(Old and New)(2008 Pattern)**

*Time :3Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) Attempt any two sections.*
- 2) Attempt any two questions from each sections.*
- 3) Answers to the two sections should be written in seperate 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 process of parturition and comment on its hormonal regulation.

**Q2)** Describe the menstrual cycle and add a note on its hormonal regulation.

**Q3)** Explain the various methods for in creasing reproductive potential.

**Q4)** Write short notes on any two:

- a) Continuous breeders
- b) Hormonal regulation of male reproduction.
- c) Climacentric
- d) Blasto cysts and its implantation.

**P. T. O**

## **SECTION-II**

### **ZY-432 : Comparative Invertebrate Histology and Histochemistry**

- Q5)** What is histochemistry? Explain the principle and procedure of histochemical detection of mucopolysaccharides.
- Q6)** Explain in detail tissue processing with paraffin. Add a note on mounting media.
- Q7)** What precautions have to be taken to histochemically detect enzymes? Explain the principle and procedure of alkaline phosphatase.
- Q8)** Write notes on:
- Stains and dyes
  - PAS-Staining

## **SECTION-III**

### **ZY-433 : Biodiversity Assessment**

- Q9)** a) Describe the necessity and importance of wild life conservation.  
b) Explain the modern tools and techniques to assess biodiversity
- Q10)** a) Explain the effects of anthropogenic alterations of environment on biosphere.  
b) Explain the classification of class mammalia with characters upto order level with suitable examples.
- Q11)** Explain the management strategies and legal aspects with respect to wildlife conservation.
- Q12)** Write short notes on:
- National parks and sanctuaries
  - Symbiosis
  - Hot spots
  - Biosphere reserves

## **SECTION-IV**

### **ZY-435 :Apiculture**

**Q13)** Describe the female reproductive system of honey bee. Add a note on nuptial flight of queen bee.

**Q14)** Explain how foraging behaviour of honey bees can be economically exploited with suitable examples.

**Q15)** Give an account of various equipments and tools used in bee keeping.

**Q16)** Write notes on:

- a) Bee dance.
- b) Apis mellifera.
- c) Need and importance of bee keeping.
- d) Honey.

