Total No. of Questions : 6]

SEAT No. :

P1417

[Total No. of Pages :1

[5433]-101
M.Sc.-I
ZOOLOGY
ZY - 101 T : BIOCHEMISTRY - I
(2013 Pattern) (Semester - I)

Time : 2:30 Hours] *[Max. Marks : 38*

Instructions to the candidates:

1) ***Attempts any three questions from Q.NO. 1 to Q.No.5.***
2) ***Question no. 6 is compulsory***
3) ***figures to the right incicates full marks.***
4) ***Draw neat labelled diagram wherever necessary.***

Q1) a) What is glycosidic bond? Explain the structure and function of storage polysaccharides. **[5]**

b) What is buffer? Explain haemoglobin buffer system. **[3]**

c) What is coenzymes? **[2]**

Q2) a) Give the biological significance of carbohydrates. **[4]**

b) Explain β – pleated structure of protein. **[4]**

c) Define Isoenzymes. **[2]**

Q3) a) Explain the effect of P^H and temperature on enzyme activity. **[5]**

b) Explain the biological significance of Vitamin C. **[3]**

c) Explain lecithins. **[2]**

Q4) a) Explain the reversible enzyme inhibition. **[4]**

b) Explain sources and function of vitamin B12. **[4]**

c) Name two essential amino acids. **[2]**

Q5) a) Classify proteins with suitable examples. **[5]**

b) Derive M-M equation. **[5]**

Q6) Write short notes on (any two) **[8]**

a) Fat soluble vitamins.

b) Quaternary structure of protein.

c) Allosteric enzymes.

d) Draw the structure of following tripeptide.
Val-Ala-Pro.

❍❍❍❍

Total No. of Questions : 6]

SEAT No. :

P1418

[Total No. of Pages :1

[5433]-102
M.Sc.
ZOOLOGY
ZY - 102 T : Cell Biology
(2013 Pattern) (Semester - I) (3-Credits)

Time : 2½ Hours] *[Max. Marks : 38*

Instructions to the candidates:

1) ***Attempt any three questions from Q.NO. 1 to Q.No.5.***
2) ***Q.No.6 is compulsory.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***figures to the right side indicate full marks.***

Q1) a) Explain role of cytoskeleton in cell motility. **[4]**
b) Write a note on peroxisomes. **[4]**
c) What is nuclear lamina? **[2]**

Q2) a) Explain mechanism of synaptic transmission. **[4]**
b) Explain polymorphism in lysosomes. **[4]**
c) What are cell adhesion molecules? **[2]**

Q3) a) Explain structure and function of desmosomes. **[4]**
b) Explain various phases of cell cycle. **[4]**
c) Explain role of Endoplasmic reticulumin xenobiotics. **[2]**

Q4) a) Describe Fluid mosaic model of plasma membrane. **[5]**
b) Give the functions of Golgi complex. **[5]**

Q5) a) Explain the ultrastructure of nuclear pore complex. **[5]**
b) Explain the role of G-Protein in signal transduction. **[5]**

Q6) Write short notes on (any two) **[8]**
a) Protein import in mitochondria
b) Importance of macromolecules in living system.
c) Genetic system in chloroplast.
c) Differentiate between mitosis and meiosis.

○○○○

Total No. of Questions :4]

SEAT No. : ____

P1419

[Total No. of Pages : 2

[5433]-103
M.Sc
ZOOLOGY
ZY- 103 (T): Genetics
(2013 Pattern) (Semester-I)

Time : 2Hours] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q.No1, 2 & 3.***
2) ***Question No.4 is compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Draw neat labelled diagrams wherever necessary.***

Q1) a) Define population genetics. State Hardy-Weinberg law and give its significance. **[4]**

b) Write a note on linkage. **[4]**

c) What do you mean by Epistasis **[2]**

Q2) a) Give the practical applications of genetics. **[3]**

b) Give the regulation of lactose operon. **[4]**

c) State the effect of environmental factors on quantitative trait. **[3]**

Q3) a) Describe the somatic cell fusion. What is the role of UV inactivated Sendai virus in hybridoma technique. **[4]**

b) Add a note on sickle cell anemia. **[3]**

c) The MN blood group system in humans is determined by two codominant alleles L^M and L^N. In a group of 308 individuals, the following genotypes were as follows: 84 MM, 72 MN and 152NN. Calculate the allelic frequecny of L^M and L^N alleles. **[3]**

Q4) In a human population of 1000 individuals the ABO blood typing was surveyed. **[5]**

The data collected is as follows: A-232, B-225, AB-52. 0-491.

i) Calculate allelic frequency l^A, l^B,l^O alleles.

ii) Number of individuals showing homozygosity for l^B allele.

OR

P.T.O.

Q4) A cross between yellow bodied(y), echinus (ec), white eye (w) female heterozygous for the above mentioned three loci and male homozygous for these loci was set up. The following progeny was obtained. **[5]**

Progeny phenotypes	Number of individuals
y+ ec w+	218
y ec+ w	236
y+ ec+ w	168
y ec w+	178
y+ ec w	95
y ec+ w+	101
y+ ec+ w+	03
y ec w	01

Calculate the gene distance between three loci. Estimate the gene sequence and construct a linkage map.

❖ ❖ ❖

Total No. of Questions : 4]

SEAT No. :

P1420

[Total No. of Pages : 2

[5433]-104
M. Sc.
ZOOLOGY
ZY - 104 : Biostatistics
(2013 Pattern) (Semester-I)

Time : 1½ Hours] *[Max. Marks : 25*

Instructions to the candidates:

1) ***Attempt any two questions from Q.No.1, 2 and 3.***
2) ***Questions No.4 is compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Use of calculator and statistical table is allowed.***

Q1) a) Define the terms : Cumulative frequency, class - mark and open end class. **[3]**

b) If length of fish is measured in mm then state the unit of mean length range, coefficient of range, variance, standard deviation and coefficient of variance. **[3]**

c) Draw 'less than ogive curve' for the following data and hence obtain median graphically. **[4]**

Plant height (cms)	0-10	10-20	20-30	30-40	40-50	50-60
No.of plants	5	10	25	30	20	10

Q2) a) Define the term: Bivariate data, scatter diagram. **[3]**

b) Define regression coefficient and state its properties. **[3]**

c) Calculate the correlation coefficient between two measurements of water quality of a lake. **[4]**

Salinity (%)	2	4	6	8	10	12	14
dissolved oxygen (mg/l)	4	2	5	10	4	11	12

P.T.O.

Q3) a) The probability that a seed geominated is 0.75. out of 12 such seeds sown, find the probability that **[3]**

i) no seed germinated

ii) exactly 3 seeds germinated

b) Define the terms: Type I error **[3]**

Type II error

c) If $X \rightarrow N(100, 25)$ then compute **[4]**

$P(X > 100)$, $P(X < 90)$, $P(90 < X < 110)$

Q4) Attempt any one of the following:

a) Describe the test procedure of chi-square test of goodness if fit. **[5]**

b) Describe the test procedure of F-test for equality of two population variance. **[5]**

Total No. of Questions :4]

SEAT No. :

P1421

[Total No. of Pages :1

[5433] - 105

M.Sc.

ZOOLOGY

ZY - 105 (T) : Skills in Scientific Communication and Writing

(2013 Pattern) (Semester - I) (Credit System)

Time : 1½ Hours] *[Max. Marks :25*

Instructions to the candidates:

1) ***Attempt any two questions from Q1, 2 & 3.***
2) ***Question No. 4 is compulsory.***

Q1) a) Explain the organization of english language. **[4]**

b) Why survey of literature is important in introduction section? **[4]**

c) What are superfluous words? **[2]**

Q2) a) Describe the contents of materials and methods. **[4]**

b) How text and data is presented in observations and results? **[4]**

c) What are Jargons? **[2]**

Q3) a) Describe discussion section of a scientific paper. **[4]**

b) How to find references from journals and books? **[4]**

c) Write any four names of research funding agencies. **[2]**

Q4) How will you write abstract of scientific paper? **[5]**

OR

Describe power point presentation with its significance. **[5]**

♦ ♦ ♦

Total No. of Questions : 4]

SEAT No. :

P1422

[Total No. of Pages : 1

[5433]-106
M.Sc. - I
ZOOLOGY
ZY - 106 T : Fresh Water Zoology
(2013 Pattern) (Semester - I) (2 Credits)

Time : 1½ Hours] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q. No. 1 to Q. No. 3.***
2) ***Question No. 4 is compulsory.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Describe respiratory adaptations in insects larvae. **[4]**

b) Describe adaptations in Rotifers. **[3]**

c) Give the Physicochemical Properties of water. **[3]**

Q2) a) Describe economic importance of reptiles. **[5]**

b) Describe Diagnostic features of fairy shrimps. **[3]**

c) Explain limnetic zone. **[2]**

Q3) a) Give protective adaptations in protozoa. **[4]**

b) Give an economic importance of mollusc. **[3]**

c) Describe Eutrophic Lake. **[3]**

Q4) Write short notes on (any one) : **[5]**

a) Describe different types of lentic habitat.

b) What is the effect sewage pollution on organism living?

⌘⌘⌘

Total No. of Questions :6]

SEAT No. : ____

P1423

[Total No. of Pages : 2

[5433]-201
M.Sc. -I
ZOOLOGY
ZY-201: Biochemistry - II
(2013 Pattern) (Semester-II)

Time : 2½ Hours] ***[Max. Marks : 38***

Instructions to the candidates:

1) ***Attempt any three questions from Q. No.1 to Q. No. 5.***
2) ***Question No. 6 is compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Draw neat labeled diagrams wherever necessary.***

Q1) a) Describe the steps of NADH production in TCA cycle. **[5]**

b) Describe the hormonal regulation in breakdown of glycogen. **[3]**

c) Explain the concept of Entropy in thermodynamic. **[2]**

Q2) a) Describe the structure and function of PDH complex. **[4]**

b) Explain in detail complex I of electron transport chain. **[3]**

c) Describe the transport of fatty acids through blood stream. **[3]**

Q3) a) Describe the regulation of Glycolysis and state its significance. **[4]**

b) What do you mean by glucogenic amino acids? List the names of glucogenic amino acids. **[3]**

c) Describe ammonia excretion. **[3]**

Q4) a) Explain the aerobic and anaerobic conversion of pyruvate. **[4]**

b) Describe the conversion of IMP to AMP and GMP. **[3]**

c) Give the structure of ATP and state its function in metabolism. **[3]**

P.T.O.

Q5) a) What do you mean by ketogenesis? Give the synthesis of ketone bodies. **[5]**

b) Explain the β oxidation of odd chain fatty acids. **[5]**

Q6) Attempt any two of the following:

a) Describe the De novo synthesis of pyrimidines. **[4]**

b) Describe oxidative deamination of amino acids. **[4]**

c) Describe purine degradation. **[4]**

❖ ❖ ❖

Total No. of Questions : 6]

SEAT No. :

P1424

[Total No. of Pages : 2

[5433]-202
M.Sc. - I
ZOOLOGY
ZY - 202 (T) : Molecular Biology (3C)
(2013 Pattern) (Semester - II)

Time : 2½ Hours] *[Max. Marks : 38*

Instructions to the candidates:

1) ***Attempt any three questions from Q. No. 1 to Q. No. 5.***
2) ***Question No. 6 is compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Draw neat labelled diagrams wherever necessary.***

Q1) a) Describe the structure of DNA. Add a note on chromatin organization. **[4]**

b) Give the types of RNA and state their function. **[4]**

c) State the different types of DNA polymerases in eukaryotes. **[2]**

Q2) a) What do you mean by composite transposons. Write a note on IS elements. **[4]**

b) What is activation of amino acid? **[4]**

c) Give any two inhibitors of protein synthesis. **[2]**

Q3) a) Describe the mechanism of transposition of non replicative transposon giving one example. **[4]**

b) Give the importance of promoter and role of enhancer in gene expression. **[4]**

c) Describe recombination repair mechanism of DNA. **[2]**

Q4) a) State the polyadenylation in eukaryotic mRNA. And give its significance. **[5]**

b) Explain the formation of peptide bond during translation. **[3]**

c) State the difference between prokaryotic and eukaryotic replication. **[2]**

P.T.O.

Q5) a) Explain the mechanism of prokaryotic gene transcription. **[5]**

b) Describe the various types of DNA damages. Add a note on base analogues. **[5]**

Q6) Attempt any two :

a) Describe how the repetitive and non-repetitive DNA sequences are estimated using Cot curve? Stating their kinetic and sequence complexity. **[4]**

b) Describe the physical properties of DNA. **[4]**

c) Describe the properties of genetic code. What is the effect of deletion and addition mutation on genetic code. **[4]**

Total No. of Questions :4]

SEAT No. : ____

P1425

[Total No. of Pages : 1

[5433]-203
M.Sc.
ZOOLOGY
ZY-203 (T): Developmental Biology
(2013 Pattern) (Semester-II) (2 Credits) (Credit System)

Time : 1½ Hours] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q. No.1 to Q. No. 3.***
2) ***Question No. 4 is compulsory.***
3) ***Neat labelled diagram must be drawn wherever necessary.***
4) ***Figures to the right side indicate full marks.***

Q1) a) Give the importance of fish as model organism. **[4]**

b) Explain the growth phase during oogenesis. **[3]**

c) What is cell ageing? **[3]**

Q2) a) Explain the role of Spemann's organizer in frog. **[5]**

b) Give the importance of fast block to polyspermy during fertilization. **[3]**

c) Explain telolecithal egg with example. **[2]**

Q3) a) Explain spiral cleavage. **[4]**

b) What is neural induction? **[3]**

c) Explain programmed morphogenetic cell death. **[3]**

Q4) Attempt any one of the following: **[5]**

a) Explain how cell cycle is regulated during early development.

b) Comment on role of Bicoid and nanas morphogen gradients in pattern formation of Drosophila.

❖ ❖ ❖

Total No. of Questions : 4]

SEAT No. :

P1426

[Total No. of Pages : 1

[5433]-204
M.Sc. - I
ZOOLOGY
ZY-204T : Endocrinology
(2013 Pattern) (Credit System) (Semester - II)

Time : 1½ Hours] *[Max. Marks : 25*

Instructions to the candidates:

1) ***Attempt any two questions from question no. 1, 2 & 3.***
2) ***Question no. 4 is compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Draw neat and labelled diagrams wherever necessary.***

Q1) a) Explain the role of gastrointestinal hormones. **[4]**

b) Describe the role of osmoregulatory hormones in osmoregulation. **[4]**

c) What is Vitellogenesis? **[2]**

Q2) a) Describe adenohypophysical hormones. **[4]**

b) Explain control of calcium metabolism. **[4]**

c) Enlist the hormones in insect metamorphosis. **[2]**

Q3) a) Explain hypothalamo - hypophysiotropins. **[4]**

b) What are X & Y organs? Explain their role in crustaceans. **[4]**

c) What are hormone receptors? **[2]**

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

a) Hormonal regulation of carbohydrate metabolism. **[5]**

b) Mechanism of hormone action. **[5]**

✦✦✦✦

Total No. of Questions : 4]

SEAT No. :

P1427

[Total No. of Pages : 1

[5433]-205
M.Sc.-I
ZOOLOGY
ZY-205 : Comparative Animal Physiology
(2013 Pattern)

Time : 1½ Hour] *[Max. Marks : 25*

Instructions to the candidates:

1) ***Attempt any two questions from Question No. 1,2 and 3.***
2) ***Question No.4 is compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Draw neat labeled diagrams wherever necessary.***

Q1) a) Discuss the role of Ca^{++} in muscle contraction. **[4]**

b) Write a note on evolution of photoreceptor. **[4]**

c) Define: Neurohormones and neurohaemal organs. **[2]**

Q2) a) Define reflexes . Add a note on Knee-Jurk reflexes. **[4]**

b) Write a note on lung ventillation. **[4]**

c) Define : Stenothermal; and ureothermal animals. **[2]**

Q3) a) Write a note on chemistry of vertebrate hormones. **[4]**

b) Explain the basic process of urine formation in mammalian kidney. **[4]**

c) Define: Resistance and tolerance. **[2]**

Q4) Write a note on gastric digestion. **[5]**

OR

Discuss the osmoregulatory strategies in animals. **[5]**

✓ ✓ ✓

Total No. of Questions : 4]

SEAT No. :

P1428

[Total No. of Pages : 2

[5433]-206

M.Sc.

ZOOLOGY

ZY - 206 (T) : Biochemical Techniques

(2013 Pattern) (Semester - II) (2 Credits)

Time : 1½ Hour] *[Max. Marks : 25*

Instructions to the candidates:

1) ***Attempt any two questions from Q.No. 1 to Q.No. 3.***
2) ***Question No. 4 is compulsory.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Define Chromatography. Add a note on Ion exchange chromatography. **[5]**

b) What are the different uses of isotopes. **[3]**

c) Define Respiratory quotient. **[2]**

Q2) a) Explain HPLC. Add a note on its advantages over traditional chromatography. **[4]**

b) Explain the principle and working of Isoelectric focussing in electrophoresis. **[3]**

c) Add a note on radiation hazards. **[3]**

Q3) a) Define centrifugation. Add a note on different types of rotors. **[4]**

b) Explain the Principle and working of G.M Counter. **[3]**

c) Explain electromagnetic spectrum. **[3]**

Q4) Explain Sangers Chain termination method of DNA sequencing. **[5]**

OR

What are the different types of support media used in electrophoresis? Add a note on benefits of Agarose gel.

P.T.O.

Total No. of Questions : 4]

P1428

[5433]-206
M.Sc.
ZOOLOGY
ZY - 206 (T) : Ichthyology
(2013 Pattern) (Semester - II) (Credit System)

Time : 1½ Hour] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Question No. 1 to Questions No. 3.***
2) ***Questions No. 4 is compulsory.***
3) ***Draw neat labelled diagrams wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Discuss parental care in fishes. **[4]**

b) Explain morphometric measurement in fishes. **[3]**

c) Discuss in brief phylogeny of fishes. **[3]**

Q2) a) Describe various anatomical modifications in digestive system of fishes. **[5]**

b) Expalin in brief sense organs in fishes. **[3]**

c) Describe catadromous fishes. **[2]**

Q3) a) Discuss the structure and function of gills. **[4]**

b) Give the functions of pituitary glands in fishes. **[3]**

c) Discuss the role of swim bladder in fishes. **[3]**

Q4) Describe any one order from class chondrichthyes with two examples. **[5]**

OR

Give an account of scales in fishes.

Total No. of Questions :8]

SEAT No. :

P1429

[Total No. of Pages :6

[5433] - 301

M.Sc. (Part - II)

ZOOLOGY

ZY - 301 T : Animal Physiology - I

(2013 Pattern) (Special Paper - 4 Credits) (Semester - III)

Time : 3 Hours] *[Max. Marks :50*

Instructions to the candidates:

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

Q1) a) What is biological rhythm? Explain tidal rhythm with suitable examples. **[4]**

b) Explain the phyletic distribution of luminescent organs. **[4]**

c) Define BMR. **[2]**

Q2) a) Describe anaerobic metabolism with suitable example. **[4]**

b) Describe the structure and functions of electroreceptors and electric organs. **[4]**

c) What is volume regulation? **[2]**

Q3) a) Describe the regulation of water and salt balance in mammals. **[4]**

b) What is buoyancy? Explain various strategies used by animals for density reduction. **[4]**

c) Define acclimation. **[2]**

Q4) a) What is excretion? Explain excretory organs used by various animal groups. **[5]**

b) Explain the properties of action potential. **[3]**

c) What is photoperiodism? **[2]**

P.T.O.

Q5) a) Describe action potential? Add a note on role of Na^+ and K^+ pump. **[5]**

b) What is high altitude sickness? Explain various physiological adaptations of high altitude. **[5]**

Q6) a) Explain the adaptation of Seals and Whales to deep sea life. **[5]**

b) Explain osmoregulation in moist skinned animals. **[5]**

Q7) a) What is biological clock? Explain endogenous clock hypothesis. **[5]**

b) What is bioluminescence? Add a note on its significance. **[5]**

Q8) a) Write a note on energy cost of locomotion. **[5]**

b) Write a note on membrane structure. **[5]**

Total No. of Questions :8]

P1429

[5433] - 301

M.Sc. - II

ZOOLOGY

ZY - 301 T : Entomology - I (Special)

(2013 Pattern) (Semester - III) (4 Credits)

Time : 3 Hours] ***[Max. Marks :50***

Instructions to the candidates:

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

Q1) a) Explain in brief the origin and evolution in insects. **[5]**

b) Explain wax gland. **[3]**

c) Explain organ of Johnston. **[2]**

Q2) a) Explain the characters of Dictyoptera with two examples. **[4]**

b) Explain tracheal system in insects. **[4]**

c) Explain frenulum. **[2]**

Q3) a) Describe the structure of dorsal blood vessel of typical insect. **[5]**

b) Sketch & label fossorial leg. **[3]**

c) Give the functions of Labium in biting & chewing insects. **[2]**

Q4) a) Give the distinguishing characters of order Diplura with two examples. **[5]**

b) Explain the characters of Mallophaga with two examples. **[3]**

c) Explain prognathous type of head with suitable example. **[2]**

Q5) a) Mention the distinguishing characters of Hymenoptera with two examples. **[4]**

b) Explain central nervous system of a generalized insect. **[4]**

c) Define pterygota. **[2]**

Q6) a) Explain polytrophic ovariole. **[4]**

b) Explain piercing & sucking type of mouthparts. **[4]**

c) Explain stridulatory pegs. **[2]**

Q7) a) Describe the structure of cuticle in insects. **[5]**

b) What is excretion? Explain the structure and functions of Fat bodies in insects. **[5]**

Q8) a) Explain female reproductive system of generalized insect. **[5]**

b) Explain corpora cardiaca and corpora allata. **[5]**

❍❍❍❍

Total No. of Questions :7]

P1429

[5433] - 301
M.Sc. - II
ZOOLOGY
ZY - 301T : Genetics - I (Special)
(2013 Pattern) (Semester - III)

Time : 3 Hours] ***[Max. Marks :50***

Instructions to the candidates:

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

Q1) a) Derive the equation for change in allelic frequency caused by natural selection against recessive allele. **[5]**

b) Explain - Relative fitness, selection coefficient & selection to response. **[3]**

c) Define - Inbreeding depression with example. **[2]**

Q2) a) What is genetic drift? Explain founder's effect. **[4]**

b) Explain genetic polymorphism with example. **[4]**

c) What is assortive mating. **[2]**

Q3) a) Explain ISH technique in detail & state its modified forms. **[4]**

b) What is gene therapy? Explain any one gene delivery system. **[3]**

c) In a population of 40 adult males & 40 adult females, the frequency of allele 'A' is 0.6 & of allele 'a' is 0.4. Calculate 95% confidence limits of the allelic frequency for A. **[3]**

Q4) a) What is genetic correlation? What are the factors that lead to genetic correlation? **[4]**

b) What are chromosomal paints? Explain their use in modern techniques of gene localization. **[4]**

c) Two alleles of a locus, A & a, can be interconverted by mutation. The rate of forward mutation 'μ' is 6.0×10^{-7} & the rate of backward mutation is 6.0×10^{-8}. What will be the frequencies of 'A' & 'a' at mutational equilibrium, assuming no migration, no selective difference & no random fluctuation caused by genetic drift. **[2]**

Q5) a) Differentiate between 'r' & 'k' selection strategists. **[4]**

b) A quantitative geneticists determines the following variance components for leaf width in a population of wild flowers growing:
Additive genetic variance = 4.2; Dominance genetic variance = 1.6; Interaction genetic variance = 0.3; Environmental variance = 2.7; Genetic variance = 0.0. **[4]**

i) Calculate broad sense heritability & narrow sense heritability for leaf width in population of wild flowers.

ii) What do heritabilities indicate about the genetic nature of leaf width variation.

c) Define allopatric speciation. **[2]**

Q6) a) Explain three modes of selection - Directional, Disruptive & Stabilizing. **[5]**

b) Explain how a phylogenetic relationship can be determined using amino acids sequencing & nucleic acid sequencing. **[5]**

Q7) a) Explain the life cycle of Drosophila. State various reasons why it is used as a model organism in genetics studies. **[5]**

b) Explain the role of Mu temperate phage in genetic studies. **[5]**

Total No. of Questions : 4]

SEAT No. : ____

P1430

[Total No. of Pages : 2

[5433]-302
M.Sc. - II
ZOOLOGY
ZY - 302 T : Immunology
(2013 Pattern) (Semester - III)

Time : 1½ Hours] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q. No. 1, 2, 3.***
2) ***Question no. 4 is compulsory.***
3) ***Figures to the right indicates full marks.***
4) ***Draw neat labelled diagram wherever necessary.***

Q1) a) Explain the hybridoma technique and its applications. **[5]**

b) Distinguish between active and passive immunization. **[3]**

c) What is immunodiffusion? **[2]**

Q2) a) Explain the clonal selection theory. **[4]**

b) What is T-cell receptors? Give their significance. **[4]**

c) Enlist primary and secondary lymphoid organs of human. **[2]**

Q3) a) What is ELISA? Add a note on types of ELISA. **[4]**

b) Explain the mechanism of antigen presentation by APC. **[4]**

c) What is immunodeficiency? **[2]**

Q4) What is major histocompatibility complex? Explain the structure and function of its classes. **[5]**

OR

What is immunity? Explain the cell mediated immunity.

⌘⌘⌘

P.T.O.

Total No. of Questions : 4]

P1430

[5433]-302
M.Sc. - II
ZOOLOGY
ZY - 302 T : Environmental Biology
(2013 Pattern) (Semester - III) (2 Credits)

Time : 1½ Hours] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q. No. 1, 2, 3.***
2) ***Question no. 4 is compulsory.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicates full marks.***

Q1) a) What is Food chain? Explain with suitable example. **[5]**

b) Write a note on extinct species of India. **[3]**

c) What is Ecotone? **[2]**

Q2) a) Describe ecological status of forest. **[5]**

b) Describe the role of Indian forest in biodiversity conservation. **[3]**

c) Give the example of endemic and extinct species? **[2]**

Q3) a) Describe the application of microbes in environmental sciences. **[4]**

b) Describe biogeochemical cycle. **[3]**

c) Impact of human activities on natural environment. **[3]**

Q4) Describe the various factors affecting wild life management. **[5]**

OR

Describe various strategies for wild life management.

⌘⌘⌘

Total No. of Questions :4]

SEAT No. : ____

P1431

[Total No. of Pages : 2

[5433]-303
M.Sc. II
ZOOLOGY
ZY- 303 (T): Genetic Toxicology
(2013 Pattern) (Credits System) (Semester-III)

Time : 1½ Hour] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q.No.1, 2 & Q. No. 3.***
2) ***Question No.4 is compulsory.***
3) ***Figures to the right side indicate full marks.***
4) ***Draw neat labeled diagrams wherever necessary.***

Q1) a) Discuss various mechanisms of mutagenesis. **[5]**

b) Write a note on types of mutations at molecular level. **[3]**

c) Define Clastogen. **[2]**

Q2) a) Describe in detail plant test system. **[5]**

b) Write a note on role of genetic toxicology in studies of congenital malformations. **[5]**

Q3) a) Explain the use of Amplification Refractory Mutation Systems (ARMS) in detecting molecular mutation. **[4]**

b) Justify "Cancer is a multimutational disease" with suitable model. **[4]**

c) Define Forensic Toxicology. **[2]**

Q4) a) Describe in detail *Drosophila* test system. **[5]**

OR

Describe applications of genetic toxicology to human and environmental monitoring. **[5]**

❖ ❖ ❖

P.T.O.

Total No. of Questions :4]

[5433]-303
M.Sc - II
ZOOLOGY
ZY- 303(T) : Aquaculture
(2013 Pattern) (2 credits) (Semester - III)

Time : 1½ Hours] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q. No. 1 Q. No. 3.***
2) ***Question No.4 is compulsory.***
3) ***Neat labelled diagram must be drawn wherever necessary.***
4) ***Figures to the right side indicate full marks.***

Q1) a) Describe the construction and application of nursery pond. **[5]**

b) Give an account of role of hard water in prawn culture. **[3]**

c) What is use of chemicals in live fish transport? **[2]**

Q2) a) Describe induced breeding techinque. **[5]**

b) Describe fungal diseases of fish. **[3]**

c) Enlist any two aquatic Insects. **[2]**

Q3) a) What is mixed culture ? **[3]**

b) Discribe composition and quality of pearl. **[3]**

c) Describe preservation and processing of fish. **[4]**

Q4) Write short notes on any one of the following. **[5]**

a) Geographical Information System. (GIS).

b) Fishing techinques.

❖ ❖ ❖

Total No. of Questions : 4]

SEAT No. :

P1432

[Total No. of Pages : 1

[5433]-304
M.Sc.II
ZOOLOGY
ZY-304: Insect physiology and Biochemisty
(Semester- III) (2013 Pattern) (2 Credits)

Time : 2½ Hours] *[Max. Marks : 25*

Instructions to the candidates:

1) ***Attempt any two questions from Q.No.1 to Q.3.***
2) ***Question No.4 is Compulsory.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Describe the structure and Physiology of Flight muscle. **[5]**

b) Describe role of moulting hormone in insect. **[3]**

c) What is ostium. **[2]**

Q2) a) What is Digestion? Describe the digestion of lipids in insect. **[5]**

b) Describe functions of fat body. **[3]**

c) What is corpora cardiaca? **[2]**

Q3) a) Describe ventillatory mechanism in insect . **[5]**

b) Describe types and fuctions of Neurosecretory cells. **[3]**

c) What is detoxification. **[2]**

Q4) Write short notes on (any one):

a) Describe structure and functions of integuments. **[5]**

c) Describe the structure and functions of Malpighian tubules.

☼☼☼☼

Total No. of Questions : 4]

SEAT No. : ____

P1433

[Total No. of Pages : 1

[5433]-305

M.Sc. - II

ZOOLOGY

ZY 305 - T - Research Methodology

(2013 Pattern) (Semester-III) (2 - Credits)

Time : 1½ Hours] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q.No.1, to Q.No.3.***
2) ***Q. No. 4 is compulsory.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Explain the importance of immunochemistry in research. **[5]**

b) Write short notes on X-ray crystallography? **[3]**

c) Define ultracentrifugation. **[2]**

Q2) a) Give an account of DNA microarray in research. **[5]**

b) What is NMR? **[3]**

c) Write the application of PCR technique. **[2]**

Q3) a) State the principle, working and advantages of electrophoresis. **[5]**

b) List out the points for the preparation of the manuscript. **[3]**

c) Write the application of MALDI TOF. **[2]**

Q4) What is Bioinformatics? Discuss in detail the different databases applied in research. **[5]**

OR

Explain the role of Biostatistics in research with the help of example. **[5]**

✠ ✠ ✠

Total No. of Questions : 4]

SEAT No. :

P1434

[Total No. of Pages : 1

[5433]-306
M.Sc. - II
ZOOLOGY
ZY - 306 T : Parasitology
(2013 Pattern) (Semester - III) (2 Credits)

Time : 1½ Hours] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q. No. 1 to Q. No. 3.***
2) ***Question no. 4 is compulsory.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Describe the life cycle and mode of transmission of *Ancyclostoma spc*. **[5]**

b) Explain the Parasitic effect benefiting the host. **[3]**

c) What is Myasis? **[2]**

Q2) a) Describe the VSG gene expression in *Trypanosoma.* **[4]**

b) Explain strain variation in *Plasmodium.* **[3]**

c) Explain Parthenogenesis in *Schistosoma sps.* **[3]**

Q3) a) Describe Immunodiagnostic assays. **[4]**

b) Explain the method of antibody synthesis. **[3]**

c) What is genetic Prophylaxis? **[3]**

Q4) a) Give an account of physiological pre-adaptations of parasites to infect host. **[5]**

OR

b) Explain ELISA test in detail.

⌘⌘⌘

Total No. of Questions : 4]

SEAT No. : ____

P1435

[Total No. of Pages : 1

[5433]-307

M.Sc. - II

ZOOLOGY

ZY 307 : T : Fundamentals of Systematics

(2013 Pattern) (Semester-III)

Time : 1½ Hour] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempts any two questions from Q.No 1,2&3.***
2) ***Question No.4 is compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Draw neat labelled diagrams wherever necessary.***

Q1) a) Describe the current approaches in taxonomy. **[5]**

b) What are the different collection techniques used for insect collection. **[3]**

c) Morphotoxonomy. **[2]**

Q2) a) What is hierarchial classification? Add a note on its advantages. **[5]**

b) Explain phylogeopgraphy. **[3]**

c) ICZN. **[2]**

Q3) a) Describe the five kingdom classification. **[3]**

b) Explain taxonomic collection & identification. **[3]**

c) What is DNA Fingerpriting? Add a note on taxonomical importance. **[4]**

Q4) Write note on any one of the following:

a) What is the use of taxonomic keys? Give its merits & demerits **[5]**

b) Explain Molecular Phylogeny & its importance. **[5]**

✠ ✠ ✠

Total No. of Questions :4]

SEAT No. :

P1436

[Total No. of Pages :1

[5433] - 308

M.Sc.-II

ZOOLOGY

ZY - 308 (T) : Insect Ecology

(2013 Pattern) (Semester - III) (2 Credits)

Time : 1½ Hours] *[Max. Marks :25*

Instructions to the candidates:

1) ***Attempt any two questions from Q.No.1 to Q.No.3.***
2) ***Question No. 4 is compulsory.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Describe in detail how biotic factors control insect population. **[5]**

b) What are the measures for insect conservation. **[3]**

c) Describe insect defoliator. **[2]**

Q2) a) Explain insect parasites. **[4]**

b) Early evolution of insects in soil. **[3]**

c) Thermoregulation in insects. **[3]**

Q3) a) Discuss the plant defense mechanism. **[4]**

b) Describe leaf shredding insects. **[3]**

c) Explain the feeding mechanism of herbivorous insects. **[3]**

Q4) Write short notes on: **[5]**

a) Insectivorous plants.

b) Beneficial insects.

♦ ♦ ♦

Total No. of Questions : 4]

SEAT No. : ____

P1437

[Total No. of Pages : 1

[5433]-309

M.Sc. - II

ZOOLOGY

ZY-309 T: TOXICOLOGY - I

(2013 Pattern) (Semester-III) (2 Credits)

Time : 1½ Hour] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q.No. 1 to Q.No. 3.***
2) ***Question No.4 is Compulsory.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks***

Q1) a) What is Toxicology? Explain its role. **[5]**

b) Describe modes of actions of toxicants. **[3]**

c) Define: Nanotoxicology. **[2]**

Q2) a) What is insecticide? Write a note on mode of action of insecticides? **[5]**

b) What is nanotechnology? Give its significance **[3]**

c) Define: LD5O **[2]**

Q3) a) Describe the toxic effects of any two heavy metals. **[4]**

b) Describe the maintenance of handling of animals in toxicology. **[3]**

c) Explain Biomagnification. **[3]**

Q4) a) Describe the mechanism of transfer & absorption of xenobiotics. **[5]**

OR

b) Describe various effects of Cadmium & mercury on living organisms.

✠ ✠ ✠

Total No. of Questions :8]

SEAT No. :

P1438

[Total No. of Pages : 6

[5433]-401
M.Sc. -II
ZOOLOGY
ZY- 401 (T) : Animal Physiology-II (Special)
(2013 Pattern) (4 credits) (Semester-IV)

Time : 3 Hours] ***[Max. Marks : 50***

Instructions to the candidates:

1) ***Attempt any five questions.***
2) ***Figures to the right indicates full marks.***
3) ***Draw neat labelled diagrams wherever necessary.***

Q1) a) Explain the contractile machinery of smooth muscle fiber. **[5]**

b) Explain the abnormalities of blood gas content. **[3]**

c) Define: BMR **[2]**

Q2) a) Explain the autonomous smooth muscle function of process of digestion. **[5]**

b) Explain Haematopoiesis. **[3]**

c) Define: A-V node **[2]**

Q3) a) Write down the process of production of heart sound during circulation. **[4]**

b) Explain gastrointestinal hormones. **[4]**

c) Define: Respiration. **[2]**

Q4) a) Explain the role of voltage gated Na^+ -K^+ channels in action potential. **[5]**

b) Explain the structure of eye and Physiology of Vision. **[5]**

Q5) a) Explain the mechanism of spread of cardiac coupling in circulation . **[5]**

b) Structure of nerve cell **[3]**

c) Define: Arteriole. **[2]**

P.T.O.

Q6) a) Explain the role of central and peripheral receptors in respiration. **[5]**

b) Explain the impact of drugs on synaptic transmission. **[3]**

c) Define: Digestion. **[2]**

Q7) a) Explain the cardiovascular response to exercise. **[4]**

b) What is Synapse? Explain the neuronal integration. **[4]**

c) Define: Nutrition. **[2]**

Q8) a) What are capillaries? Write a note on its functions. **[5]**

b) Explain anatomy of respiratory system. **[5]**

❖ ❖ ❖

Total No. of Questions :8]

P1438

[5433]-401
M.Sc. -II
ZOOLOGY
ZY- 401(T) : GENETICS - II (Special)
(2013 Pattern) (4 credits) (Semester-IV)

Time : 3 Hours] ***[Max. Marks : 50***

Instructions to the candidates:

1) ***Draw neat diagrams wherever necessary.***
2) ***Attempt any five questions.***
3) ***Marks are shown on right hand margin.***

Q1) a) Elucidate the role of genes in " Learning and memory formation" in Drosophila: **[4]**

b) Explain the following terms: **[4]**

i) Positional cloning

ii) Uniparental disomy

c) What is STS mapping **[2]**

Q2) a) Explain the genetic basis of TCR diversity. **[4]**

b) Explain the role of proto oncogenes in Tumour formation. **[4]**

c) What is RELP? **[2]**

Q3) a) Explain the defects in purine metabolism with respect to Lesch-Nyohn Syndrome. **[4]**

b) Explain in brief-cell hybrids. **[3]**

c) Explain Hereditary cancer with suitable example. **[3]**

Q4) a) Explain gene mapping by FISH Technique. **[4]**

b) Write a note on FACS technique. **[4]**

c) Define: Synteny Homology. **[2]**

Q5) a) Explain the role of Twin studies and adaptation studies in determining the "Nature and Nurture" factor. **[5]**

b) Explain the characteristics of sex-linked recessive inheritance. **[3]**

c) Define: QTL. **[2]**

Q6) a) Explain the mechanism of dosage compensation in human beings. **[5]**

b) What are hemoglobinopathies? Explain the molecular mechanism of any one disorder related to hemoglobin. **[5]**

Q7) a) Explain the mechanism of Genomic Imprinting? **[5]**

b) Explain - 'Triple screen' method of pre-notal diagnosis. **[5]**

Q8) a) Explain various banding patterns used for chromosomal identification in cytological studies. **[5]**

b) Explain the molecular basis of Tay-sach's disease. **[5]**

❖ ❖ ❖

Total No. of Questions :8]

P1438

[5433]-401
M.Sc. - II
ZOOLOGY
ZY- 401(T) : ENTOMOLOGY - II (Special)
(2013 Pattern) (Semester-IV) (4 credits)

Time : 3 Hours] ***[Max. Marks : 50***

Instructions to the candidates:

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

Q1) a) What is gastrulation? Explain the process of gastrulation in insects. **[5]**

b) Explain oviposition habits in insects laying eggs in ootheca. **[3]**

c) Explain formation of acrosome during spermiogenesis. **[2]**

Q2) a) Sketch & label polytrophic ovariole. **[4]**

b) Describe apodous larva with suitable examples. **[4]**

c) Define blastokinesis. **[2]**

Q3) a) Describe the process of fertilization in insects. **[5]**

b) Explain paurometabolous development. **[3]**

c) Explain campodeiform larva with suitable example. **[2]**

Q4) a) Describe embryonic development of reproductive system in insects. **[5]**

b) Explain oligopod phase of insect embryo. **[3]**

c) Explain naiad. **[2]**

Q5) a) Describe exarate pupa with suitable examples. **[4]**

b) Explain ageing in insects. **[4]**

c) Explain emergence from the pupa. **[2]**

Q6) a) Describe development of insects up to germ band formation. **[4]**

b) Describe hormonal control of metamorphosis in insect. **[4]**

c) Explain ametabolous development. **[2]**

Q7) a) Describe embryonic development of nervous system in insects. **[5]**

b) Describe initiation and preparation for diapause. **[5]**

Q8) a) Describe formation of embryonic membranes in insects. **[5]**

b) What is regeneration? Explain regeneration in insects. **[5]**

❖ ❖ ❖

Total No. of Questions : 4]

SEAT No. :

P1439

[Total No. of Pages : 2

[5433]-402

M.Sc. - II

ZOOLOGY

ZY - 402 (T) : Economic Zoology

(2013 Pattern) (2 Credits) (Semester - IV)

Time : 1½ Hours] *[Max. Marks : 25*

Instructions to the candidates:

1) ***Attempt any two questions from Question No. 1 to Question No. 3.***
2) ***Question No. 4 is compulsory.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) What are soil protozoa? Give the role of soil protozoa in agriculture. **[4]**

b) Explain the steps in sponge culture. **[4]**

c) Name the plant parasitic nematodes. **[2]**

Q2) a) What is apiculture? Enlist the equipment used in beekeeping operation. **[5]**

b) Explain the layout of prawn culture unit. **[3]**

c) Name any four pests of stored grains. **[2]**

Q3) a) What is a coral reef? Mention the different types of coral reefs. **[4]**

b) Comment on the Indian dairy industry. **[4]**

c) Give the uses of lac. **[2]**

Q4) Write short note on any one : **[5]**

a) Poultry farming.

b) Wool industry.

P.T.O.

Total No. of Questions : 4]

P1439

[5433]-402
M.Sc. - II
ZOOLOGY
ZY - 402 (T) : Bacterial and Phage Genetics
(2013 Pattern) (2 Credits) (Semester - IV)

Time : 1½ Hours] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Question No. 1 to Question No. 3.***
2) ***Question No. 4 is compulsory.***
3) ***Neat labelled diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Explain jumping genes. **[4]**

b) Discuss general morphology and properties of bacteriophages. **[3]**

c) Explain reversion. **[3]**

Q2) a) Discuss the use of transduction in chromosomal mapping. **[5]**

b) Explain Auxotroph with example. **[3]**

c) Define cistron. **[2]**

Q3) a) Describe in detail the molecular switch between lytic and lysogenic cycle of Bacteriophage lambda. **[5]**

b) Write a note on Replication of RNA phages with respect to MS2 and 2beta. **[5]**

Q4) Write a note on life cycle and nucleic acid structure of T_2 and T_4 phase. **[5]**

OR

Explain in brief the complementation and complementation groups in bacterial chromosomes. **[5]**

Total No. of Questions :4]

SEAT No. :

P1440

[Total No. of Pages : 2

[5433]-403
M.Sc. -II
ZOOLOGY
ZY- 403 (T): Mammalian Reproductive Physiology
(2013 Pattern) (2 credits) (Semester-IV)

Time : 1½ Hours] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q.No1 to Q. No 3.***
2) ***Question No.4 is compulsory.***
3) ***Draw neat labelled diagrams wherever necessary.***
4) ***Figures to the right indicates full marks.***

Q1) a) Explain the hormonal regulation of reproduction and write a note on feedback mechanism. **[5]**

b) Describe the testicular hormones **[3]**

c) What is puerperium? **[2]**

Q2) a) What is infertility? Write a note on its causes and treatment **[5]**

b) Explain continuous and seasonal breeding **[3]**

c) What is suckling reflex? **[2]**

Q3) a) Describe structure of mammary gland and explain the process of milk synthesis. **[5]**

b) Explain chemical methods of contraception with suitable example in males. **[3]**

c) Name the ovarian hormones. **[2]**

Q4) a) Explain Sexual cycles in mammals with respect to primates and non-primates. **[5]**

OR

What is conception? Explain the process of blastocyst formation and implantation.

❖ ❖ ❖

P.T.O.

Total No. of Questions :4]

P1440

[5433]-403
M.Sc. II
ZOOLOGY
ZY- 403(T) : Biodiversity Assessment
(2013 Pattern) (2 credits) (Semester-IV)

Time : 1½ Hours] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q No. 1, 2 and 3.***
2) ***Question No.4 is compulsory.***
3) ***All questions carry equal marks.***
4) ***Figures to the right indicate full marks.***
5) ***Draw neat labelled diagrams wherever necessary.***

Q1) a) Write about the objectives and strategies of conservation. **[4]**

b) Write about the ethical and aesthetic values of Biodiversity. **[3]**

c) Describe conservation through a network of protected areas. **[3]**

Q2) a) Write a note on Endangered animal species as a threat to biodiversity. **[4]**

b) Describe class mammalia with suitable examples **[3]**

c) Explain biodiversity as a biological capital of the earth. **[3]**

Q3) a) Write a note on Biogeographical classification of India. **[4]**

b) Discuss the importance of Blue data book. **[3]**

c) What is species biodiversity? Explain the importance of species biodiversity. **[3]**

Q4) Write about the patterns of cosses , causes and factors of mass extinction of biodiversity. **[5]**

OR

Write the characteristic features of phylum Arthropoda. **[5]**

❖ ❖ ❖

Total No. of Questions : 4]

SEAT No. :

P1442

[Total No. of Pages : 1

[5433]-405
M.Sc.-II
ZOOLOGY
ZY-405 (T) : POLLUTION BIOLOGY
(2013 Pattern) (2-Credits) (Semester-IV)

Time : 1½ Hour] *[Max. Marks : 25*

Instructions to the candidates:

1) ***Attempt any two questions from Q.No1 to 3.***
2) ***Question No.4 is compulsory.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Explain the sources, pathways and impact of pesticide pollution. **[4]**

b) Explain the histological methods to study the impact of pollution on animals. **[4]**

c) Describe lithosphere. **[2]**

Q2) a) Describe the sources and effect of radioactive pollution. **[4]**

b) Explain monitoring strategies of soil pollution. **[3]**

c) Define pollutant. Describe the effects of air pollution. **[3]**

Q3) a) What is biomagnification? Describe its causes and consequences. **[4]**

b) Explain biological methods for assessment of environmental quality. **[3]**

c) Describe sources and effects of noise pollution. **[3]**

Q4) a) Describe biomedical waste handling and management **[5]**

OR

b) What is bioassay? Explain pollutant bioassay using fish. **[5]**

✓ ✓ ✓

Total No. of Questions : 4]

SEAT No. :

P1443

[Total No. of Pages : 1

[5433]-406
M.Sc. - II
ZOOLOGY
ZY - 406 T : Apiculture
(2013 Pattern) (Semester - IV) (2 Credit)

Time : 1½ Hours] *[Max. Marks : 25*

Instructions to the candidates:

1) ***Attempt any two questions from Q.1 to Q.3.***
2) ***Question No.4 is compulsory.***
3) ***Draw neat labeled diagrams wherever ncessary.***

Q1) a) Describe two story Langstroth ten frame hive. **[5]**

b) Explain Limitations of the beelcing. **[3]**

c) Bee venom. **[2]**

Q2) a) Discuss foragins behaviour of bee. **[4]**

b) Explain polymorphism of Honey bee. **[4]**

c) Honey **[2]**

Q3) a) Describe communication in bee. **[4]**

b) Explain queen vearing techniques. **[4]**

c) Cast system in bee. **[2]**

Q4) Write short notes on any one of the following: **[5]**

a) Advantages of beekeeping.

b) Describe insects enemies of bess.

✪✡✪✡

Total No. of Questions : 4]

SEAT No. :

P1444

[Total No. of Pages : 1

[5433]-407
M.Sc. - II
ZOOLOGY
ZY - 407 - T : Pest Control
(2013 Pattern) (2 Credits) (Semester - IV)

Time : 1½ Hours] *[Max. Marks : 25*

Instructions to the candidates:

1) ***Attempt any two questions from Q.1 to Q.3.***
2) ***Question No.4 is compulsory.***
3) ***Figures to the right indicate full marks.***

Q1) a) Describe cultural control methods in pest control. **[5]**

b) Describe stored grain pests. **[3]**

c) Physical control measures. **[2]**

Q2) a) Explain the harmonal control of insects. **[4]**

b) Describe veterinary pests. **[4]**

c) Biological control measures. **[2]**

Q3) a) Give control measures for crabs & snails. **[4]**

b) Describe Dusters. **[4]**

c) House hold pest. **[2]**

Q4) Write short notes on (any one): **[5]**

a) IPM

b) Mechanical control measures

✪✡✪✡

Total No. of Questions : 4]

SEAT No. :

P1445

[Total No. of Pages : 1

[5433]-408
M.Sc. - II
ZOOLOGY
ZY - 408 T : Toxicology - II
(2013 Pattern) (Semester - IV) (2 Credits)

Time : 1½ Hour] ***[Max. Marks : 25***

Instructions to the candidates:

1) ***Attempt any two questions from Q.No1 to Q.No.3.***
2) ***Question no 4. is compulsory.***
3) ***Neat diagram must be drawn wherver necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Explain detoxification of any one CP compound. **[4]**

b) Describe Biotransformation. **[3]**

c) Describe disposal of biomedical waste. **[3]**

Q2) a) Give advantages & limitations of toxicogenomics. **[5]**

b) Write a note on good laboratory practices on lab safety. **[3]**

c) Define : Detoxification. **[2]**

Q3) a) Describe the inactivation of xenobiotics. **[5]**

b) Write a note on CPCSEA guidelines. **[3]**

c) Define : Bioactivation **[2]**

Q4) a) Describe the absorption of toxic agents through gastrointestinal tract. **[5]**

OR

b) Describe the legal aspects of use of animals.

❄❄❄❄