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**M.Sc. (Part – I) (Semester – I) Examination, 2015
ZOOLOGY (Paper – II)
Tools and Techniques in Biology**

Day and Date : Friday, 17-4-2015

Total Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

- Instructions :** 1) *Question 1, 2 and 6 are compulsory.*
2) *Attempt any two questions from Question 3, 4 and 5.*
3) *Draw neat labelled diagrams wherever necessary.*
4) *Figures to the right indicate marks.*

1. 1) The radioactive element used to study newly synthesized proteins is

14

- a) Sodium
b) Chlorine
c) Nitrogen
d) Potassium

2) Which would be best to separate a protein that binds strongly to its substrate ?

- a) Gel filtration
b) Affinity chromatography
c) Cation exchange
d) Anion exchange

3) In plasmid pBR322, BR stands for _____

- a) Experiment number
b) Plasmid number
c) Name of scientists
d) Name of animal

4) ELISA is used for _____

- a) Separate viral RNA
b) Purify proteins
c) Isolate DNA
d) Identify specific proteins

5) The best technique to separate isoenzymes is _____

- a) Paper chromatography
b) Electrophoresis
c) Microscopy
d) Thin layer chromatography



6) Shadow casting is used in microscopy _____

- a) TEM
- b) SEM
- c) Phase contrast
- d) Fluorescence

7) Hybridomas are produced by fusion of _____

- a) Selected lymphocytes
- b) Lymphocytes and tumour cell
- c) Tumour cells and Hela cells
- d) Hela cells and plants cells

- 2. Discuss the steps in construction of Recombinant DNA. 14
- 3. A) Describe the technique used to produce Monoclonal antibodies. 7
 B) Comment on the uses of cell hybrids ? 7
- 4. A) Describe the methods to isolate cell organelles. 5
 B) Add a note on differential centrifugation. 5
 C) Homogenisation. 4
- 5. Explain in detail the technique.
 A) Electrophoresis. 7
 B) Chromatography. 7
- 6. Write short notes on **any four** of the following : 14
 a) ECG
 b) Shuttle vector
 c) Radio immunoassay
 d) IR spectrometer
 e) MRI
 f) Cryotomy.



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M.Sc. – I (Semester – I) Examination, 2015
ZOOLOGY
Cell and Molecular Biology (Paper – III)

Day and Date : Monday, 20-4-2015
Time : 11.00 a.m. to 2.00 p.m.

Total Marks : 70

Instructions: 1) Q. 1, Q. 2 and Q. 6 are **compulsory**.
2) Attempt **any two** from Q. 3, 4 and 5.

1. Choose the correct alternative. (Per question 2 marks) : **14**
- 1) _____ contain enzymes related to metabolism of hydrogen peroxide (H_2O_2).
a) Endosomes
b) Peroxisomes
c) Lysosomes
d) All of the above
 - 2) Ubiquitin marks the cytosolic proteins for degradation in _____.
a) proteasomes
b) lysosomes
c) endosomes
d) none of the above
 - 3) Neighboring _____ are connected by linker DNA.
a) endosomes
b) peroxisomes
c) nucleosomes
d) ribosomes
 - 4) Tight junction and gap junctions are found in
a) connective tissue
b) epithelial tissue
c) neural tissue
d) muscular tissue
 - 5) Microfilaments are composed of _____.
a) Actin
b) Actin and Myosin
c) Myosin
d) Cellulose
 - 6) The scavengers of free radicals are called as _____.
a) Flavonoids
b) Tocopherol
c) Antioxidants
d) Vitamin C
 - 7) Loss of _____ repair systems can lead to cancer.
a) DNA
b) RNA
c) a) and b)
d) None of the above



2. Explain in detail post transcriptional modification and protein sorting in Golgi apparatus. 14
 3. A) Give the structure and functions of microtubules. 7
B) Explain the virus induced cell transformations. 7
 4. A) Explain in brief causes of cancer. 5
B) Explain in brief pathogen induced diseases in animals. 5
C) Explain the membrane proteins and other proteins in ER. 4
 5. A) Explain in brief structure and function of mitochondria. 7
B) Explain in brief structure and function of peroxisomes. 7
 6. Short notes (**any four**) : 14
 - 1) Hemidesmosomes
 - 2) Antioxidants
 - 3) Collagen
 - 4) Glycosaminoglycans
 - 5) Actin binding protein
 - 6) Active transport across cell membrane.
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M.Sc. – I (Semester – I) Examination, 2015
ZOOLOGY (Paper – IV)
Population Genetics and Evolution

Day and Date : Wednesday, 22-4-2015
Time : 11.00 a.m. to 2.00 p.m.

Max. Marks : 70

Instructions: 1) Q. 1, Q. 2 and Q. 6 are **compulsory**.
2) Attempt **any two** from Q. 3, 4, 5.

1. MCQ (Per question 2 marks) :

14

- 1) Lamarckism is conveniently known as _____
 - a) Natural selection theory
 - b) Germplasm theory
 - c) Mutation theory
 - d) Use and disuse theory
- 2) The main feature of the biological species concept its emphasis on the _____
 - a) Large morphological differences between different species
 - b) Genetic variation within populations
 - c) Role of sexual reproduction in maintaining diversity within a species
 - d) Absence of gene flow between different species
- 3) A small, isolated population is more likely to undergo speciation than a large population because a small population _____
 - a) is more affected by genetic drift and natural selection
 - b) contains relatively more genetic diversity
 - c) is more susceptible to gene flow
 - d) has a higher mutation rate
- 4) The Hardy-Weinberg law describes _____
 - a) Genotype frequencies of a population when evolutionary forces are not acting
 - b) How sexual reproduction would change the relative gene frequencies in a population
 - c) How mutations occur and balance each other
 - d) Genotype frequencies of a population when evolutionary forces are acting

P.T.O.



- 5) The present day epoch is _____
a) Palaeozoic b) Coenozoic c) Mesozoic d) Triassic
- 6) Sympatric speciation occurs most commonly in _____
a) Mammals b) Fishes c) Amphibians d) Birds
- 7) A change in the relative abundance of an alleles (the allelic frequency) within a population over a succession of generation is called _____
a) Micro-evolution or adaptive evolution
b) Macro-evolution or speciation
c) Co-evolution
d) Phylogenetic evolution
2. Describe Darwin's theory of evolution with suitable example. 14
3. Answer the following :
- A) Describe the phenotypic variations. 7
- B) Explain molecular analysis of quantitative traits. 7
4. Explain the following :
- A) Gene evolution. 5
- B) Factors affecting human disease frequency. 5
- C) Loss of genetic variation. 4
5. A) Explain Hardy-Weinberg law of genetic equilibrium. 7
- B) Describe patterns and mechanism of reproductive isolation. 7
6. Short notes (**any four**) : 14
- 1) Natural selection
- 2) Evolution of gene families
- 3) Phenotypic variation
- 4) Genetic drift
- 5) The evolutionary time scale
- 6) Parapatric model of speciation.
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M.Sc. (Part – I) (Semester – II) Examination, 2015
ZOOLOGY (Paper – V)
Computational Biology

Day and Date : Thursday, 16-4-2015
Time : 11.00 a.m. to 2.00 p.m.

Total Marks : 70

- Instructions :** 1) Questions **1, 2 and 6** are **compulsory**.
2) Attempt **any two** questions from questions **3, 4 and 5**.
3) Draw **neat** labeled diagrams **wherever** necessary.
4) Figures to the **right** indicate marks.

1. Multiple choice questions :

14

- 1) _____ distribution summarizes the mass of data.
 - a) Binomial
 - b) Frequency
 - c) Probability
 - d) Correlation
- 2) _____ is defined as a sum of all observations.
 - a) Mean
 - b) Median
 - c) Mode
 - d) Dispersion
- 3) An elementary measure of dispersion is _____
 - a) Frequency
 - b) Range
 - c) Deviation
 - d) Mode
- 4) _____ means the spread of actual value around measure of central tendency.
 - a) Correlation
 - b) Dispersion
 - c) Central tendency
 - d) Probability
- 5) For a perfect +ve correlation, the value correlation 'r' = _____
 - a) – 1
 - b) +0.9
 - c) +1
 - d) – 0.9



- 6) Range of following data is _____
8, 10, 15, 18, 17, 28, 22, 20
a) 10 b) 15 c) 17 d) 20
- 7) The science which deals with collection, analysis and interpretation of numerical facts is _____
a) Biotechnology b) Bioinformatics
c) Biostatistics d) Biomagnification
2. Describe different measures of central tendency and add a note on its merits and demerits. 14
3. Answer the following :
- A) Explain types of correlation with help of scatter diagram. 7
B) Define regression. Explain uses of regression. 7
4. Explain the following :
- A) Explain multiplication theorem of probability. 5
B) Define Chi square test of goodness of fit. 5
C) Describe properties of normal curve. 4
5. Explain the following :
- A) Describe concept of variation and define standard deviation. 7
B) Give the classical definition of probability and show that : 7
1) $0 \leq P(A) \leq 1$ and
2) $P(\bar{A}) = 1 - P(A)$
6. Write short notes on **any 4** : 14
- 1) Analysis of variance
2) Student 't' test
3) Binomial distribution
4) Merits and demerits of range
5) 'Z' test
6) Karl Pearson coefficient of correlation.
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M.Sc. (Part – I) (Semester – II) Examination, 2015
ZOOLOGY (Paper – VI)
General and Comparative Endocrinology

Day and Date : Saturday, 18-4-2015

Max. Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

- Instructions:** 1) Question 1, 2 and 6 are **compulsory**.
2) Attempt **any two** questions from question 3, 4 and 5.
3) Draw neat labeled diagrams **wherever** necessary.
4) Figures to the **right** indicate marks.

1. Multiple choice questions for each unit 2 marks. 14

- 1) The Pars intermedia is the source of _____ Hormone.
- a) Melanocyte Stimulating b) LH Stimulating
c) Oestrogen Stimulating d) Androgen Testies
- 2) Secretin is one of many peptide hormone of
- a) Stomach b) Small intestine
c) Kidney d) Liver
- 3) Cushing Syndrome is due to hyper secretion of cortisol by
- a) Thyroid gland b) Adrenal cortex
c) PHH d) Pancreas
- 4) _____ hormone increases fear behavior as well as active and passive type of avoidance behavior
- a) Glucagon b) Insulin c) ACTH d) Gastrin



5) Hormone that binds to cell surface receptor and require the second messenger camp is

- a) Calcitriol
- b) Bile
- c) Pancreatic juice
- d) Antidiuretic hormone

6) Oxytocin is also known as

- a) Parturation Hormone
- b) Menstrual Hormone
- c) Fear behavior Hormone
- d) Migratory Hormone

7) Juvenile Hormone is

- a) Digestion Hormone
- b) Molting Hormone
- c) Killing Hormone
- d) Growth Hormone

2. Long answer type question compulsory : 14

Describe in detail classification and chemical nature of hormone.

3. Answer the following :

A) Hormonal Transportation and degradation. 7

B) Comment upon role of hormones on behaviour. 7

4. Explain the following :

A) Hormonal role in development and metamorphosis in insects. 5

B) Role of male hormone. 5

C) Role of MSH Hormone. 4

5. Explain in short :

A) Hormones of homeostasis. 7

B) Hormones of pancreatic gland. 7

6. Short notes (**any four**) : 14

1) Ecdysone hormone in insect.

2) Hormones of posterior lobe of pituitary gland.

3) Hormonal role in Migration.

4) Role of hormone in parental behavior.

5) Progesterone Hormone.

6) Corpus luteum.



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M.Sc. – I (Semester – II) Examination, 2015
ZOOLOGY
Paper – VII : Developmental Biology

Day and Date : Tuesday, 21-4-2015
Time : 11.00 a.m. to 2.00 p.m

Total Marks : 70

Instructions : 1) Q. 1, Q. 2 and Q. 6 are **compulsory**.
2) Attempt **any two** from Q. 3, 4 and 5.

1. MCQ (Per question 2 marks) :

14

- 1) Rotational type of cleavage is seen in _____
 - A) Sea-urchin
 - B) Frog
 - C) Birds
 - D) Mammals
- 2) Which of the following series of events represents the path of vertebrate development ?
 - A) formation of blastula, cleavage, neurulation, cell migration, gastrulation, organogenesis, growth
 - B) formation of blastula, cleavage, gastrulation, neurulation, cell migration, organogenesis, growth
 - C) cleavage, formation of blastula, gastrulation, neurulation, cell migration, organogenesis, growth
 - D) cleavage, gastrulation, formation of blastula, neurulation, cell migration, organogenesis, growth
- 3) What would be the likely result of a mutation of the *bcl-2* gene on the level of apoptosis ?
 - A) no change
 - B) a decrease in apoptosis
 - C) an increase in apoptosis
 - D) first it would increase, but later it would decrease
- 4) A tube of tissue formed by a thickening and rolling up of the neural plate during embryonic neurulation. It will later form the brain and spinal cord of the animal. This is called
 - A) Neurocoel
 - B) Neural groove
 - C) Neurospore
 - D) Neural tube



- 5) The technique of producing a genetically identical copy of an organism by replacing the nucleus of an unfertilized ovum with the nucleus of a body cell from the organism is
- | | |
|---------------------------|-------------------|
| A) Test tube baby | B) Cloning |
| C) In vitro fertilization | D) All A, B and C |
- 6) The study of degenerative changes in aging is called
- | | |
|--------------------------|--------------|
| A) Developmental biology | B) Paedology |
| C) Gerontology | D) Chorology |
- 7) _____ is the process of selection of activation of some genes by a cell, which are not activated by other cells of the embryo.
- | | |
|-------------------------|------------------------|
| A) Cell induction | B) Cell transformation |
| C) Cell differentiation | D) Cell mediation |
2. Describe in detail the process of fertilization in mammals. 14
3. Answer the following :
- | | |
|---------------------------------------|---|
| A) Polyspermy. | 7 |
| B) Sexual reproduction in Eukaryotes. | 7 |
4. Explain the following :
- | | |
|-----------------------------|---|
| A) Cloning with an example. | 5 |
| B) Regeneration in Hydra. | 5 |
| C) Epimorphosis. | 4 |
5. Explain in short :
- | | |
|--|---|
| A) How dorsal-ventral axis is specified in Chordates ? | 7 |
| B) Apoptosis with reference to limb bud. | 7 |
6. Short notes (**any four**) : 14
- 1) Stem cells
 - 2) Vitellogenesis
 - 3) Cleavages in Frog
 - 4) Corona radiata
 - 5) Hen's egg
 - 6) Differentiation.
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M.Sc. (Part – I) (Semester – II) Examination, 2015
ZOOLOGY
Paper No. – VIII : Environmental Physiology

Day and Date : Thursday, 23-4-2015

Total Marks : 70

Time: 11.00 a.m. to 2.00 p.m.

- Instructions :** 1) Question 2 and 6 are **compulsory**.
2) Attempt **any 2** questions from questions 3, 4 and 5.
3) Draw **neat** labeled diagram **wherever** necessary.
4) Figures to the **right** indicate **marks**.

1. Multiple choice questions :

14

- 1) Muscular contraction of alimentary canal is
 - a) Circular
 - b) Deglutition
 - c) Churning
 - d) Peristalsis
- 2) Function of vitamin K is
 - a) Respiration
 - b) Carbohydrate metabolism
 - c) Regulation of calcium
 - d) Blood clotting
- 3) The volume of air breathed in and out during effortless respiration is referred to as
 - a) Vital volume
 - b) Residual volume
 - c) Tidal volume
 - d) Ideal volume
- 4) Breathing rate above normal is called as
 - a) Bradypnoea
 - b) Orthopnoea
 - c) Eupnea
 - d) Tachypnoea
- 5) Which one of the following mineral control heart ?
 - a) Sulphur
 - b) Sodium
 - c) Iron
 - d) Potassium
- 6) Lymph is colorless because
 - a) WBC are absent
 - b) WBC are present
 - c) Haemoglobin is absent
 - d) RBC are absent



- 7) Homeothermic animal is the one
- a) in whom temperature of the body changes with change in the atmospheric temperature
 - b) in whom temperature of the body is maintained within narrow limits
 - c) in whom heat loss is greater than the heat gain
 - d) in whom heat loss is greater than the heat loss
2. Explain physiology of blood circulation. **14**
3. Answer the following :
- A) Describe various types of nutrition. **7**
 - B) Types of respiration. **7**
4. Explain the following :
- A) Functions of blood. **5**
 - B) Basal Metabolic Rate. **5**
 - C) Hormonal control of digestive secretion. **4**
5. Explain in short :
- A) Process of blood coagulation. **7**
 - B) Functions of liver. **7**
6. Write short note on (**any four**) : **14**
- a) Space physiology
 - b) Strain
 - c) Occupational diseases
 - d) ECG
 - e) High altitude adaptation
 - f) Factors affecting blood pressure.
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M.Sc. (Part – II) (Semester – III) Examination, 2015
ZOOLOGY (Paper – IX)
Molecular Cytogenetics

Day and Date : Wednesday, 15-4-2015
Time : 3.00 p.m. to 6.00 p.m.

Total Marks : 70

- Instructions :**
- 1) Question Nos. 1, 2 and 6 are **compulsory**.
 - 2) Attempt **any two** questions from 3, 4 and 5.
 - 3) Draw **neat** labelled diagram **wherever** necessary.
 - 4) Figures to the **right** indicate marks.

1. Choose correct answer :

14

- 1) Prenatal diagnosis of Sickle cell anemia with enhanced sensitivity was done by _____ technique.
 - a) Northern blotting
 - b) PCR
 - c) FISH
 - d) GISH
- 2) The DNA of T4 Phage contains _____
 - a) ATGC
 - b) AGT, S-hydroxymethyl cytosine
 - c) AGC and cyclobutyl thymine
 - d) AGUC
- 3) The effect of the Y chromosome on gonadal sex determination is mediated by a gene _____
 - a) SRY Gene
 - b) GAM gene
 - c) Xol gene
 - d) myc gene
- 4) RNAs that catalyze biological reactions, such as self-splicing introns, are _____
 - a) Enzymes
 - b) Spliceosomes
 - c) Ribozymes
 - d) RNase
- 5) The regions of DNA in a eukaryotic gene that encode a polypeptide product are
 - a) hnRNAs
 - b) exons
 - c) enhancers
 - d) leader sequences



- 6) Which of the following molecules functions to transfer information from the nucleus to the cytoplasm ?
- a) DNA
 - b) mRNA
 - c) tRNA
 - d) Proteins
- 7) The sex ratio (X/A) of a normal female in *Drosophila* is _____
- a) 0.5
 - b) 1.0
 - c) 2.0
 - d) Between 0.5 and 1

2. How is sex determined in *Drosophila* ? Explain the dosage compensation in it. **14**
3. A) Explain different banding techniques of chromosome. **7**
B) Add a note on telomere and its maintenance. **7**
4. Explain in short :
- A) Human Karyotype. **5**
 - B) C-value paradox. **5**
 - C) Thalassemia. **4**
5. Explain in brief :
- A) DNA sequencing. **7**
 - B) Transposable elements. **7**
6. Write short notes on **any four** of the following : **14**
- a) Satellite DNA
 - b) Topoisomerases
 - c) Yeast genome
 - d) Host cell restriction
 - e) Plasmid
 - f) Cellular check points.
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M.Sc. (Part – II) (Semester – III) Examination, 2015
ZOOLOGY (Paper – XII)
Biochemistry

Day and Date : Wednesday, 22-4-2015
Time : 3.00 p.m. to 6.00 p.m.

Total Marks : 70

Instructions: 1) Questions number 1, 2 and 6 are **compulsory**.
2) Attempt **any two** from question number 3, 4 and 5.

1. Write the following sentences selecting most correct answer from the given options.

14

- 1) Ribozymes are _____ functioning as biological catalysts.
a) Proteins b) Lipids c) DNA d) RNA
- 2) Proteins contain _____ linkages in their structure.
a) Phosphodiester b) Peptide
c) Glycosidic d) Ester
- 3) _____ is composed of fructose and glucose.
a) Sucrose b) Lactose
c) Maltose d) Cellobiose
- 4) Pyridoxal phosphate is a coenzyme in _____ group transfer reactions.
a) Methyl b) Ethyl c) Amino d) Acyl
- 5) One NADH is equivalent to _____ ATP molecules.
a) 1 b) 1.5 c) 2 d) 2.5
- 6) Allosteric enzymes gives _____ curve.
a) Parabolic b) Bell shaped
c) Sigmoidal d) Hyperbolic
- 7) The number of ATP produced in the succinate dehydrogenase step in TCA is _____
a) 1 b) 2 c) 3 d) 4



2. What is electron transport chain ? Illustrate various components involved in it. **14**
3. Answer the following :
- A) With structures and enzymes explain biosynthesis of cholesterol. **7**
 - B) Structure of DNA. **7**
4. Explain in detail :
- A) Classification and biological significance of lipids. **5**
 - B) Cyclic AMP and its role. **5**
 - C) Isoenzymes. **4**
5. Explain in short :
- A) Coenzymes. **7**
 - B) Ribozymes. **7**
6. Write notes on **any four** : **14**
- a) Clover-leaf structure of t-RNA
 - b) Inhibition of enzymes
 - c) Site directed mutagenesis
 - d) Biochemical role of Vitamin A
 - e) Cyclic AMP
 - f) Purines.
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Seat No.	
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M.Sc. – II (Semester – IV) Examination, 2015
ZOOLOGY (New) (C.G.P.A. Pattern)
Paper No. XIII : Animal Biotechnology

Day and Date : Thursday, 16-4-2015

Total Marks : 70

Time : 3.00 p.m. to 6.00 p.m.

Instructions: 1) Q. 1 and Q. 2 and Q. 6 are **compulsory**.
2) Attempt **any two** from Q. No. 3, 4 and 5.

1. Select the correct alternative (per question 2 marks) : **14**
- 1) Which of the following media is used for the growth of selected cells ?
 - a) Nutrient media
 - b) Minimal media
 - c) Selective media
 - d) Differential media
 - 2) Early embryonic development up to cleavages is controlled by _____
 - a) maternal effect genes
 - b) zygotic genes
 - c) an interplay between maternal effect genes and zygotic genes
 - d) none of the above
 - 3) The trp operon encodes _____ enzymes needed in the biosynthesis of tryptophan.
 - a) 3
 - b) 4
 - c) 5
 - d) 6
 - 4) cDNA can be formed from RNA by enzyme _____
 - a) Transcriptase
 - b) Reverse transcriptase
 - c) Ligase
 - d) DNAase
 - 5) DNA on transposones possess genes which encodes _____
 - a) Transposase
 - b) Reverse transcriptase
 - c) Transcriptase
 - d) All the above



6) _____ is a method used in molecular biology for detection of specific DNA sequence in DNA samples.

- a) Northern blotting
- c) Western blotting

- b) Southern blotting
- d) All the above

7) In eukaryotes, transcription is initiated by _____

- a) RNA polymerase I
- c) RNA polymerase III

- b) RNA polymerase II
- d) RNA polymerase IV

2. What is operon concept ? Explain with reference to lac-operon. 14
3. A) Explain the mechanism of protoplast fusion. 7
B) Explain hybridoma technology. 7
4. A) Explain the process of DNA methylation. 5
B) Synthesis of mRNA. 5
C) Adult stem cells. 4
5. A) Give in detail mechanism of transposition. 7
B) Properties of genetic code. 7
6. Write short notes on (**any four**) : 14
- 1) FISH
 - 2) Application of genetic engineering in medicine
 - 3) Introns and Exons
 - 4) Heterochromatin
 - 5) Attenuation
 - 6) PCR.
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Seat No.	
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**M.Sc. (Part – II) (Semester – IV) Examination, 2015
ZOOLOGY (Paper – XIV) (New) (CGPA Pattern)
Applied Zoology**

Day and Date : Saturday, 18-4-2015
Time : 3.00 p.m. to 6.00 p.m.

Total Marks : 70

- Instructions :** 1) Question 1, 2 and 6 are **compulsory**.
2) Attempt **any two** questions from questions 3, 4 and 5.
3) Answers to the Sections I, II and III are to be written in the **same** answer book.
4) **Draw** neat labeled diagrams **wherever** necessary.
5) Figures to the **right** indicate **marks**.

SECTION – I

1. Choose the correct option :

14

- 1) In Bio bioweapon _____ is used.
 - a) Mycobacterium
 - b) E. Coli
 - c) Staphylococcus
 - d) Bacillus anthreus
- 2) Spleen cells and myeloma cell fusion is made in presence of _____
 - a) Ammonium SO₄
 - b) HPRT
 - c) HAT
 - d) Polyethylene glycol
- 3) Monoclonal abs are produced by _____
 - a) Hydridoma technology
 - b) PCR technique
 - c) HPLC technique
 - d) Attenuation technique
- 4) Antibodies are produced by _____
 - a) Lymphocytes
 - b) Blood cells
 - c) Antigen
 - d) Complement
- 5) The test tube baby means _____
 - a) A baby grown in test tube
 - b) Fertilized and developed embryo in test tube
 - c) Fertilization and development both in uterus
 - d) Fertilization in vitro and then transplantation

P.T.O.



- 6) _____ is nutrient rich, natural fertilizer and soil conditioner.
 - a) Urea
 - b) Indoleacetic acid
 - c) Vermicompost
 - d) All above

- 7) The protein _____ is primarily responsible for stimulating platelet clumping.
 - a) Globulin
 - b) Albumin
 - c) Keratin
 - d) Fibrinogen

SECTION – II

- 2. What is an antigen ? Define antigenicity and explain how various factors affect antigenicity. 14

- 3. Explain in short :
 - A) Give an account on semen analysis. 7
 - B) Describe procedure of amniocentesis and its application. 7

- 4. Explain in short :
 - A) Earthworm as a protein source. 5
 - B) Give an account on Vermiculture. 5
 - C) Development of polyclonal sera. 4

- 5. A) Write an easy on 'Biological Warfare'. 7
 B) Blood cell Routine tests. 7

SECTION – III

- 6. Write short notes on **any four** of the following : 14
 - 1) Modern contraceptives.
 - 2) T lymphocytes.
 - 3) Common methods of biological warfare.
 - 4) Collection and Cryopreservation of gametes.
 - 5) IVF.
 - 6) Molecular basis of host parasitic interaction.



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M.Sc. (Part – II) (Semester – IV) Examination, 2015
ZOOLOGY
(New CGPA Pattern)
Paper – XV : Environmental Biology and Toxicology

Day and Date : Tuesday, 21-4-2015
Time : 3.00 p.m. to 6.00 p.m.

Max. Marks : 70

- Instructions:** 1) Questions 1, 2 and 6 are **compulsory**.
2) Attempt **any two** from questions 3, 4 and 5.
3) Draw **neat** labeled diagram **wherever** necessary.
4) Figures to the **right** indicate marks.

1. Multiple choice questions for **each** Unit 2 marks. **14**
- 1) The study of interaction between living organisms and environment is called as _____
a) Ecosystem
b) Ecology
c) Phytogeography
d) Phytosociology
 - 2) The role of an organism in an ecological system is known as _____
a) Habitat b) Niche c) Interaction d) Ecotone
 - 3) Increase in fauna and decrease in flora would be harmful due to increase in _____
a) Diseases
b) CO₂
c) O₂
d) Radioactive pollution
 - 4) The food chain in which microorganisms break down dead producers is called _____
a) Consumer food chain
b) Predator food chain
c) Parasitic food chain
d) Detritus food chain
 - 5) A community that starts the process the process of succession in an habitat is called _____
a) Biotic community
b) Abiotic community
c) Pioneer community
d) Artificial community



- 6) Gas leaked in Bhopal gas tragedy was _____
- a) Potassium iso thiocyanate b) Phytooxidants
c) Methyl isocyanate d) Ethyl isocyanate
- 7) Which of the following on inhalation dissolves in blood hemoglobin more rapidly than O₂ ?
- a) SO₂ b) O₃ c) NO d) CO

2. Describe industrial pollution with relation to textile, sugar and dairy. **14**
3. A) Describe toxic agents in household use. **7**
B) Describe the components of Ecosystem. **7**
4. A) Discuss on solid waste management. **5**
B) Describe biology and ecology of pond water ecosystem. **5**
C) Describe the biological indicators of pollution. **4**
5. Explain in short :
- 1) Waste water management. **7**
2) Energy flow in Ecosystem. **7**
6. Short notes : Attempt **any four** : **14**
- 1) Types of ecosystem
2) Minamata disease
3) Soil toxicants
4) Pesticides
5) Carcinogens
6) Food additives and food color.
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Seat No.	
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**M.Sc. (Part – II) (Semester – IV) Examination, 2015
ZOOLOGY (Paper – XVI) (New) (CGPA Pattern)
Zoo Keeping and Animal House Management**

Day and Date : Thursday, 23-4-2015
Time : 3.00 p.m. to 6.00 p.m.

Total Marks : 70

- Instructions:**
- 1) Question 1, 2 and 6 are **compulsory**.
 - 2) Attempt **any two** questions from questions 3, 4 and 5.
 - 3) Answers to the Sections I, II and III are to be written in the **same** answer book.
 - 4) Draw **neat** labeled diagrams **wherever** necessary.
 - 5) Figures to the **right** indicate marks.

SECTION – I

14

- 1) Rabies is a zoonotic _____ disease which infects domestic and wild animals.
a) Viral b) Bacterial c) Hematic d) Helminth
- 2) In India crocodile breeding centre is located in _____
a) Kolkata b) Chennai c) Chilica lake d) Tiruvanantpuram
- 3) Zoonosis means _____
a) Animal disease transmitted to man
b) Disease of man transmitted to animals
c) Parasites of man transmitted to animals
d) Viral diseases of man transmitted to animals
- 4) Identification of missing zoo tiger in wild can be done with _____
a) Pug marks b) Dentition
c) Band pattern and a photograph d) Fingerprints
- 5) Spoiling of zoo by physical and chemical factors is termed _____
a) Contamination b) Adulteration
c) Poisoning d) Pollution

P.T.O.



- 6) Many animals are specialized or adapted by structure, physiology and habits for a particular mode of life in their respective environments. This is _____
- a) Fully true in nature b) Partly true in nature
c) Cause of extinction d) In support with biotic theory
- 7) Cryopreservation involves storage of gametes in liquid nitrogen at _____
- a) 0°C b) 5°C c) -196°C d) 100°C

SECTION – II

2. What is ethogram ? What is the role of ethogram in study of animals in captivity ? **14**
3. Explain in short :
- A) Quarantine procedure to introduce a new arrival in a zoo. **7**
B) Ethical issues of Zoo. **7**
4. Explain in short :
- A) Rearing guinea pigs **5**
B) Crocodile management **5**
C) Veterinary care of a zoo. **4**
5. A) How to prevent infection of water Birds ? **7**
B) Discuss role of illumination in laboratory rodents, with special reference to albino rats. Compare it with that of a guinea pig. **7**

SECTION – III

6. Write short notes on **any four** of the following : **14**
- 1) Housing in small birds
2) Reptile housing
3) Contraception in zoo mammals
4) Bird feeds
5) Zoo mammals diseases
6) Zoo regulations as per Central Zoo Authority.
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