



SLR-MN – 644

Seat No.	
-------------	--

**M.Sc. – I (Semester – I) Examination, 2016
(New C.B.C.S. Pattern)
ZOOLOGY
Tools and Techniques in Biology (Paper – II)**

Day and Date : Thursday, 31-3-2016

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

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

1. MCQ (Per question **2** marks) :

14

- 1) To enter or leave a cell, substances must pass through
 - a) microtubule
 - b) the Golgi apparatus
 - c) a ribosome
 - d) the plasma membrane
- 2) Bacterial cell are prokaryotic; in comparison to a typical eukaryotic cell they would
 - a) be smaller
 - b) have a smaller nucleus
 - c) lack a plasma membrane
 - d) have fewer internal membranous compartments
- 3) Cell fractionation is the most appropriate procedure for preparing _____ for study.
 - a) isolated cells which are normally found tightly attached to neighbouring cells
 - b) cells without a functional cytoskeleton
 - c) isolated organelles
 - d) none of the above
- 4) The radicals of _____ are polymerized during preparation of polyacrylamide gel.
 - a) acrylamide
 - b) N-N'-methylene-bis-acrylamide
 - c) TEMED
 - d) riboflavin

P.T.O.



SLR-MN – 645

Seat No.	
-------------	--

**M.Sc. – I (Semester – I) Examination, 2016
(New CBCS Pattern)
ZOOLOGY
Cell and Molecular Biology (Paper – III)**

Day and Date : Saturday, 2-4-2016

Total Marks : 70

Time : 10.30 a.m. to 1.30 p.m.

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

1. MCQ (Per question **2** marks) :

14

- 1) Lysosomes contain enzymes that can
 - a) Lower the pH of the cytosol
 - b) Synthesize protein
 - c) Synthesize ATP
 - d) Degrade many type of cellular molecule
- 2) Which of the following cell components is not part of cytoskeleton of eukaryotic cell ?
 - a) Microfilament
 - b) Mitochondria
 - c) IF
 - d) Microtubules
- 3) A signal sequence is located at the
 - a) N-terminus
 - b) C-terminus
 - c) Cytosolic face of ER
 - d) 5' end of m-RNA
- 4) Actin filaments in motor elements cell can depolymerise and repolymerise to generate cell motion in
 - a) Days
 - b) Hours
 - c) Minutes
 - d) 1-2 milliseconds
- 5) Microfilaments are composed of
 - a) Actin
 - b) Actin and Myosin
 - c) Myosin
 - d) Cellulose

P.T.O.



- 6) Compared to the microfilaments, intermediate filaments are
 - a) Less stable in detergent and high salt
 - b) Always less abundant regardless of cell type
 - c) More easily dissociated by cytochalasin
 - d) More cell type specified
- 7) The region of the cell with in the plasma membrane, but outside of organelles is the
 - a) Cytosol
 - b) Matrix
 - c) Vacuole
 - d) Nucleoplasm

- 2. Long answer type question : 14
 - 1. Give an account on Cytoskeleton.
 - 3. Answer the following :
 - A) Structure and dynamics of Microfilaments. 7
 - B) Chemical synapses. 7
 - 4. Explain the following :
 - A) Cancer cell morphology and properties 5
 - B) Flagella : Structure and Dynamics 5
 - C) Lysosomal assembly and functions. 4
 - 5. Explain in short :
 - A) Cell matrix and cell matrix adhesion 7
 - B) Actin-binding proteins. 7
 - 6. Write short notes (**any four**) : 14
 - 1) Membrane proteins and other proteins in ER
 - 2) Biogenesis of mitochondria
 - 3) Cell junctions
 - 4) Centriole
 - 5) Biology of Cancer
 - 6) Collagens.
-



Seat No.	
----------	--

**M.Sc. – I (Semester – I) Examination, 2016
(New C.B.C.S. Pattern)
ZOOLOGY
Population Genetics and Evolution (Paper – IV)**

Day and Date : Tuesday, 5-4-2016
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

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

1. MCQ (Per question 2 marks) :

14

- 1) Members of the same species which are capable of interbreeding is best described as a(n) : _____
 - a) Community
 - b) Population
 - c) Ecosystem
 - d) Biosphere
- 2) Which of the following would cause deviation from the Hardy-Weinberg equilibrium ?
 - a) Small population
 - b) Isolated
 - c) Random mating
 - d) Lack of selection pressure no mutations
- 3) The total aggregate of alleles in a population is referred to as
 - a) The gene pool
 - b) The allelic frequency
 - c) The genotypic frequency
 - d) The genetic structure
- 4) The effects of natural selection may be countered by
 - a) Gene flow
 - b) Genetic drift
 - c) Mutation
 - d) Inbreeding
- 5) Mating with relatives is called
 - a) Inbreeding
 - b) Outcrossing
 - c) Random mating
 - d) Clines



- 6) The random loss of alleles in a population is called
- a) Mutation
 - b) Selection
 - c) Genetic drift
 - d) Electrophoresis
- 7) What is the ultimate source of genetic variability ?
This is the correct answer
- a) Mutation
 - b) Migration
 - c) Genetic drift
 - d) Selection

2. Long answer type question : 14
Give an account on the role of Genomic studies and its use in Biodiversity.
3. Answer the following :
- A) Describe in detail Migration of birds. 7
 - B) Give an account on Microevolution. 7
4. Explain the following :
- A) Loss of genetic variation. 5
 - B) Phylogenetic gradualism. 5
 - C) Applications of Hardy-Weinberg equation. 4
5. Explain in short :
- A) Sympatric speciation. 7
 - B) Allopatric speciation. 7
6. Write short notes (**any four**) : 14
- 1) Natural Selection and its parameters
 - 2) Reproductive isolation
 - 3) Assessment of molecular variation
 - 4) Estimation of heritability
 - 5) Neo-Darwinism
 - 6) Meiotic drive.
-



Seat No.	
----------	--

M.Sc. – I (Semester – II) Examination, 2016
Paper – V (New CBCS)
ZOOLOGY
Computational Biology

Day and Date : Wednesday, 30-3-2016
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

Note : 1) Q. 1, 2 and 6 are **compulsory**.
2) Answer **any two** questions from Q. 3, 4 and 5.

1. Multiple choice questions (per question 2 marks) : 14
- i) The table giving the frequencies for different class interval is known as _____
- a) Mean
b) Frequency table
c) Median
d) Bivariate table
- ii) _____ is defined as the value of the middle observations when arranged in order of their magnitude.
- a) Median
b) Mean
c) Mode
d) None of the above
- iii) _____ is defined as sum of all observations in the distribution divided by number of observations.
- a) Mean
b) Median
c) Mode
d) None of the above
- iv) If we divide the distribution into 100 equal parts, the points of division are called _____
- a) quartile
b) percentile
c) decile
d) none of the above
- v) The diagrams obtained by taking classes on X axis and corresponding frequencies along Y axis is called _____
- a) Polygon
b) Histogram
c) Frequency curve
d) Ogive curve



Seat No.	
----------	--

**M.Sc. – I (Semester – II) Examination, 2016
(New CBCS)
ZOOLOGY**

General and Comparative Endocrinology (Paper – VI)

Day and Date : Friday, 1-4-2016

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

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

1. MCQ (Per question 2 marks) (**Compulsory**) : **14**

- 1) Lactogenic hormone inhibits _____ development.
a) Liver b) Gonadal c) Pancrease d) Brain
- 2) Sub-oesophageal ganglion is responsible for _____
a) Pigmentation b) Growth c) Death d) Excretion
- 3) Ecdyosone hormone is secreted by _____
a) Corpus cardiacum b) Sorporallata
c) Thoracic ganglion d) Abdominal ganglion
- 4) Vasopressin is secreted by _____ pituitary gland.
a) Anti-lobe b) Post-lobe c) Vertical d) Parallel
- 5) MSH secretion is controlled by _____ hormone.
a) LH b) Catacholamine
c) Insulin d) Parathyroid
- 6) Over production of GH hormone during early post natal development leads to _____
a) Blindness b) Dumb c) Gigantism d) Infertility
- 7) Steroidogenic tissue of adrenal gland secretes a numbers of steroid hormones profoundly affects on _____ metabolism.
a) Lipid b) Carbohydrate and mineral
c) Protein d) Fat



2. Long answer type question (**Compulsory**) : **14**
Describe in detail biosynthesis of amino acid derivatives of steroid hormones.
3. Answer the following :
- A) Role of parathyroid hormones (in calcium homeostasis). **7**
- B) Islets of Langerhans. **7**
4. Explain the following :
- A) Juvenile hormone. **5**
- B) Role of ACTH. **5**
- C) Menstrual cycle. **4**
5. Explain in short.
- A) Classification of hormones. **7**
- B) Role of FSH in migration. **7**
6. Write short notes **any four (Compulsory)** : **14**
- 1) Role of LH.
- 2) Role of MSH.
- 3) Function of oestrogen.
- 4) Prostaglandins.
- 5) Role of calcitonin.
- 6) Role of androgen.
-



Seat No.	
-------------	--

**M.Sc. – I (Semester – II) Examination, 2016
ZOOLOGY (New) (CBCS Pattern)
Paper – VII : Developmental Biology**

Day and Date : Monday, 4-4-2016
Time : 10.30 a.m. to 1.00 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) Superficial cleavage is seen in _____
 - a) isolecithal
 - b) centrolecithal
 - c) telolecithal
 - d) mesolecithal
- 2) Bottle cells are formed during the gastrulation of
 - a) amphibians
 - b) birds
 - c) echinoderms
 - d) mammals
- 3) Micropyle is found in the eggs of _____
 - a) insects
 - b) birds
 - c) echinoderms
 - d) mammals
- 4) Trophoblast cells in mammals give rise to _____
 - a) yolk sac
 - b) allantois
 - c) chorion
 - d) amnion
- 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 anterior – posterior axis is specified in – during oogenesis of _____
 - a) Amphioxus
 - b) Drosophila
 - c) Echinoderms
 - d) Mammals
- 7) Primitive streak is formed during the development of _____
 - a) reptiles
 - b) birds
 - c) mammals
 - d) all of the above



2. Describe in detail the process of gastrulation in frog. **14**
3. Answer the following :
- A) Acrosome reaction. **7**
 - B) Structure of amphioxus egg. **7**
4. Explain the following :
- A) Cloning with an example. **5**
 - B) Blastulation in chick. **5**
 - C) Regulation of limb development. **4**
5. Explain in short :
- A) How anterior – posterior axis is specified in Drosophila ? **7**
 - B) Apoptosis with reference to development of fingers and toes. **7**
6. Short notes (**any four**) : **14**
- 1) Embryonic Stem cells
 - 2) Oogenesis
 - 3) Cleavages in Chick
 - 4) Cortical reaction
 - 5) Capacitation
 - 6) Fertilisation.
-



SLR-MN – 654

Seat No.	
-------------	--

M.Sc. – I (Semester – II) (New CBCS Pattern) Examination, 2016
ZOOLOGY
Environmental Physiology (Paper – VIII)

Day and Date : Wednesday, 6-4-2016

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

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

1. Multiple Choice Questions (Rewrite the sentence with correct answer) : **14**
- 1) The term homeostasis in relation to temperature is defined as
 - A) Maintenance of processes to increase the body temperature
 - B) Maintenance of processes to keep a constant body temperature
 - C) Maintenance of processes to keep the skin cool
 - D) None of the above
 - 2) Identify the term that describes what happens to blood vessels when an animal is hot
 - A) Vasoconstriction
 - B) Vasodilatation
 - C) None of the above
 - D) All the above
 - 3) The equipment used for taking an animal's temperature
 - A) Stethoscope
 - B) Sphygmomanometer
 - C) Thermometer
 - D) None of the above
 - 4) Which of the following plays the biggest role in maintaining Homeostasis ?
 - A) The liver
 - B) The gall bladder
 - C) The pancreas
 - D) The pancreas and gall bladder are tied

P.T.O.



- 5) Having abnormally high levels of glucose in the blood stream can result in which of the following conditions ?
A) Diarrhoea B) Diabetes C) Homeostasis D) Conjunctivitis
- 6) An enzyme in the stomach that breaks down protein
A) Amylase B) Pepsin C) Lugols D) Benedicts
- 7) What is the harm from the depletion of Earth's ozone layer ?
A) The average temperature of earth's surface will increase gradually
B) The oxygen content of the atmosphere will decrease
C) Increased amount of Ultra violet radiation will reach earth's surface
D) Sea levels will rise as the polar ice caps will gradually melt
2. Write an account on concept of homeostasis. 14
3. Answer the following :
- A) Environmental stress due to noise. 7
B) BMR. 7
4. Explain the following :
- A) Cellular level adaptation. 5
B) Blood pressure. 5
C) Industrial health hazard. 4
5. Explain in short :
- A) Fatigue 7
B) ECG. 7
6. Short note (**any four**) : 14
- A) Causes of stress
B) Structure of mammalian heart
C) Neural regulation of respiration
D) Mechanism of adaptation
E) Space physiology
F) Occupational diseases.
-



Seat No.	
-------------	--

M.Sc. – II (Semester – III) (CGPA Pattern) Examination, 2016
ZOOLOGY
Paper – IX : Molecular Cytogenetics

Day and Date : Tuesday, 29-3-2016
Time : 2.30 p.m. to 5.00 p.m.

Total Marks : 70

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

1. Select the correct alternative. (Per question 2 marks) : **14**

- 1) The non-coding sequences on mRNA is called as _____
 - a) AUG sequence
 - b) AUU sequence
 - c) Exon
 - d) Intron

- 2) _____ is a technique used in molecular cytogenetics.
 - a) Northern blotting
 - b) Southern blotting
 - c) Western blotting
 - d) Karyotyping

- 3) RNAs that catalyze self-splicing introns are known as _____
 - a) Small non-coding RNAs
 - b) m RNAs
 - c) Both coding and non-coding RNAs
 - d) Ribozymes

- 4) Fully processed mRNA in the eukaryotic nucleus is obtained after _____
 - a) Pre transcription of mRNA
 - b) Post transcriptional modifications
 - c) Only splicing
 - d) Only capping



- 5) Cytogenetic mapping
- a) Requires that the gene have been cloned if in situ hybridization is to be used
 - b) Is a high resolution method of gene localization
 - c) Can be used to determine relative order of genes located
 - d) All of the above
- 6) Bacterial DNA is free from _____
- a) intron
 - b) exon
 - c) a) and b)
 - d) none of the above
- 7) Transposons are also called as _____
- a) Jumping genes
 - b) Transposable elements
 - c) Mobile genetic element
 - d) All the above
2. Give an account on sex determination and dosage compensation in humans. **14**
3. A) Explain the techniques in human chromosome analysis. **7**
B) Explain the use of plasmids. **7**
4. A) Explain Chromosome painting technique. **5**
B) Explain C_value paradox. **5**
C) What is Genomic library ? **4**
5. A) Explain the cytogenetic implications of numerical alterations of chromosomes. **7**
B) Explain the genetics of PKU. **7**
6. Write note on **(any four)** : **14**
- 1) Application of RFLP
 - 2) Restriction endonuclease
 - 3) Genomic hybridization
 - 4) Transposition
 - 5) DNA Sequencing
 - 6) Cell cycle.
-



Seat No.	
----------	--

M.Sc. (Part – II) (Semester – III) (C.G.P.A.) Examination, 2016
ZOOLOGY
Biochemistry
Paper No. – XII

Day and Date : Tuesday, 5-4-2016

Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

Instruction : Attempt any two from question number 3, 4 and 5.

1. Rewrite the following sentences by choosing the most correct alternative given below (**Each** carries **two** marks) : **14**
- i) The standard free energy change of hydrolysis of ATP to ADP is _____ Kcal/mole.
a) – 35 b) – 30.5 c) –15.7 d) –7.3
- ii) _____ coenzyme is involved in electron transfer reactions.
a) TPP b) Cobamide
c) NAD⁺ d) Tetrahydrofolate
- iii) The first electron acceptor in electron transport chain from NADH is
a) FAD b) Ubiquinone c) Cytochrome d) FMN
- iv) On net gain of ATP on β -oxidation palmitic acid is
a) 100 b) 106 c) 120 d) 136
- v) The most important epimer of glucose is
a) Galactose b) Xylose c) Arabinose d) Fructose
- vi) The enzyme inhibition in which K_m increases and V_{max} remains constant is _____ inhibition.
a) Competitive b) Uncompetitive
c) Non-competitive d) Mixed type
- vii) Electron transport chain takes place _____ of mitochondria.
a) Inside matrix b) In inner membrane
c) In outer membrane d) Inside inter-membrane space



2. Long answer type question : 14
Describe in detail the IUB classification and nomenclature system of enzymes.
3. Answer the following : 7
A) Discuss the metabolic regulation during hypoxia. 7
B) Explain in detail pyrimidine biosynthesis pathway. 7
4. Explain the following : 5
A) Redox potential. 5
B) Oxidative phase of pentose phosphate pathway. 4
C) tRNA. 4
5. Explain in short : 7
A) Structure and role of polysaccharides. 7
B) Biosynthesis of triacylglycerol. 7
6. Write short notes (**any four**) : 14
1) Abzymes.
2) Hydrogen bonding.
3) Aromatic amino acids.
4) A-DNA.
5) Concept of free energy.
6) Allosteric enzymes.
-



- 7) A technique which enables selective amplification of DNA sequence is known as the _____
- a) Amplification technique b) Hybridization technique
c) PCR d) All the above
2. What is central dogma ? Explain with reference to protein synthesis. **14**
3. A) Explain the principle and technique of nucleic acid hybridization. **7**
B) Explain principle and working of PCR. **7**
4. A) Write note on DNA methylation. **5**
B) Explain mechanism of transposition. **5**
C) Embryonic stem cells. **4**
5. A) Explain regulation of gene expression in prokaryotes. **7**
B) Explain structure of mRNA. **7**
6. Write note on **(any four)** : **14**
- 1) Ethical issues in human cloning and biotechnology.
 - 2) Heterochromatin.
 - 3) Transposones.
 - 4) Ribonucleoprotein.
 - 5) RNA splicing.
 - 6) DNA methylation.
-



Seat No.	
-------------	--

**M.Sc. (Part – II) (Semester – IV) Examination, 2016
ZOOLOGY (Paper – XIV) (CGPA)
Applied Zoology**

Day and Date : Friday, 1-4-2016
Time : 2.30 p.m. to 5.00 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. 1) The protein _____ is primarily responsible for stimulating platelet clumping. 14
a) Globulin b) Albumin c) Keratin d) Fibrinogen
- 2) _____ is nutrient rich, natural fertilizer and soil conditioner.
a) Urea b) Indoleacetic acid
c) Vermicompost d) All above
- 3) _____ is an antiglobular test.
a) Widal b) ELISA c) RIA d) Coombs test
- 4) Cryopreserved gametes or embryos are frozen and maintained under _____
a) Liquid nitrogen b) Liquid paraffin
c) DMSO d) Frozen ice
- 5) The process of blood clotting and then the subsequent dissolution of the clot, following repair of the injured tissue, is termed _____
a) Hemostasis b) Homeostasis
c) Fibric clot d) Fibrosis



Seat No.	
-------------	--

**M.Sc. (Part – II) (Semester – IV) (CGPA) Examination, 2016
ZOOLOGY**

Paper – XV : Environmental Biology and Toxicology

Day and Date : Monday, 4-4-2016

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

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

1. Multiple choice questions. For **each** unit **2** marks : **14**
- 1) Fluoride pollution mainly affects
a) Kidney b) Brain c) Heart d) Teeth
 - 2) Gas leaked in Bhopal gas tragedy was
a) Potassium iso thiocyanate
b) Phytooxidants
c) Methyl isocyanate
d) Ethyl isocyanate
 - 3) Sound becomes hazardous at _____ decibels
a) Above 30 b) Above 80 c) Above 20 d) Above 50
 - 4) Ozone layer of upper atmosphere is being destroyed by
a) SO₂ b) Photooxidants
c) Chlorofluorocarbon d) Smog
 - 5) The study of interaction between living organisms and environment is called as
a) Ecosystem b) Ecology
c) Phytogeography d) Phytosociology



- 6) 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
- 7) Taj Mahal at Agra is damaged by
- a) Sulphur dioxide
 - b) Chlorine
 - c) Hydrogen
 - d) Oxygen
2. Describe classification of toxicants, toxic agents, mode of action. **14**
3. A) Describe food chain and energy flow in an ecosystem. **7**
B) Describe toxic agents in household use. **7**
4. A) Explain in brief conservation of natural resources. **5**
B) Describe biology and ecology of pond water ecosystem. **5**
C) Describe the effects of noise pollution. **4**
5. Explain in short :
- A) Explain rain water harvesting system. **7**
 - B) Describe management of green house. **7**
6. Short notes on **any 4** : **14**
- 1) Induced pisciculture.
 - 2) Carcinogens.
 - 3) Grassland ecosystem.
 - 4) Biological indicators of pollution.
 - 5) Carbon cycle.
 - 6) Biomagnification.
-



- 6) Cryopreservation involves storage of gametes in liquid nitrogen at _____
 a) 0° C b) 5° C c) – 196° C d) 100° C
- 7) Taxidermy is a technique of _____
 a) Skinning the wild animal
 b) Skinning and stuffing the wild animal
 c) Preparing wild animal duplicates
 d) Arranging bones of wild animals in order

SECTION – II

2. Give an account of Management of Water birds. 14
3. Explain in short :
 A) Bird feeds 7
 B) Laboratory Rat 7
4. Explain in short :
 A) Visitor rules regulations and surveillance in a zoo. 5
 B) Crocodile Conservation 5
 C) First aid to the zoo animals 4
5. A) Discuss housing practices is common zoo Mammals. What special precautions are to be taken in keeping Elephants in Zoo ? 7
 B) How to prevent infection of Reptilia ? 7

SECTION – III

6. Write short notes on **any four** of the following : 14
- 1) Management of grain eater and birds.
 - 2) Avian Diseases
 - 3) Elephant and camel management
 - 4) Conservation of Tigers
 - 5) Veterinary services in zoo
 - 6) Snake identification.
-