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Set **P**

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017
Zoology
BIOSYSTEMATICS

Day & Date: Thursday, 16-11-2017
 Time: 10.30 AM to 01.00 PM

Max. Marks: 70

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

Q.1 Multiple choice questions (Per question 2 marks): **14**

- 1) Ichthyology is the study of _____.
 - a) Fishes
 - b) Viruses
 - c) Mammals
 - d) Amphibians
- 2) The class Mammalia is divided into subclasses and infraclasses based on _____.
 - a) Reproductive system
 - b) The presence or absence of mammary glands.
 - c) The number of appendages.
 - d) Skeletal system
- 3) _____ is that branch of biology dealing with the identification and naming of organisms.
 - a) Taxidermy
 - b) Taxonomy
 - c) Agronomy
 - d) None of the above
- 4) _____ is known as Father of Taxonomy.
 - a) Otto Brunfels
 - b) Andrea
 - c) Cesalpino
 - d) Carolus Linnaeus
- 5) Taxonomy is the Science of _____.
 - a) Identification
 - b) Survey
 - c) Group
 - d) Classification and Nomenclature
- 6) Double ventral Nerve cord is found in _____.
 - a) Peripatus
 - b) Leech
 - c) Earthworm
 - d) Tape worm
- 7) Cladogenesis is _____.
 - a) The evolution of a new species from an ancestral species.
 - b) The diversification of a species into two or more species as groups adapt to different environments.
 - c) The process by which ultraviolet radiation causes mutations that in turn result in evolution.
 - d) The evolution of a old species from an ancestral species.

Q.2 Define species? Describe different concepts, and other intraspecific categories. **14**

Q.3 Answer the following.

- a) Immunological techniques. **07**
- b) Taxonomic keys, their merits and demerits. **07**

- Q.4 Explain the following.**
- a) Biological classification. **05**
 - b) Applications of Biosystematics. **05**
 - c) Binomial Nomenclature. **04**
- Q.5 Explain in short:**
- a) Historical resume of Systematics. **07**
 - b) How to Construct Phylogenetic Trees? **07**
- Q.6 Write short notes on any four of the following:** **14**
- a) International Code of Zoological Nomenclature.
 - b) Systematic publications.
 - c) Sympatric speciation.
 - d) DNA- DNA Hybridization.
 - e) Parsimony methods of Phylogenetic inference.
 - f) Apomictic species.

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M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017
Zoology

TOOLS AND TECHNIQUES IN BIOLOGY

Day & Date: Saturday, 18-11-2017

Max. Marks: 70

Time: 10.30 AM to 01.00 PM

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

Q.1 Multiple choice questions (Per question 2 marks): **14**

- 1) The radioactive element used to study newly synthesized proteins is_____.
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) Immunoblotting is introduced in _____ technique.
a) Southern blotting b) Western blotting
c) Northern blotting d) All of above
- 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 & tumour cell
c) Tumour cells & Hela cells d) Hela cells & plants cells

Q.2 Discuss the steps in Proteomics. **14**

Q.3 Answer the following.

- a) Describe the technique used to produce Monoclonal antibodies. **07**
- b) Comment on the uses of cell hybrids? **07**

Q.4 Explain the following.

- a) Lasers in Biology. **05**
- b) Autoradiography **05**
- c) Flowcytometry **04**

Q.5 Explain in short :

- a) Agarose Electrophoresis. **07**
- b) Column Chromatography. **07**

Q.6 Write short notes on any four of the following:

- a) Radioimmunoassay.
- b) FTIRspectrometer
- c) Cell transformation.
- d) Cryotomy.
- e) Ultracentrifugation.
- f) X- rays in Biology.

Q.5 Explain in short :

- a) What are the cell junctions? Add a note on desmosomes. **07**
- b) Describe post translational modification of proteins. **07**

Q.6 Write short notes on any four of the following: **14**

- a) Functions of Golgi apparatus.
- b) Gap junction.
- c) Plasmodesmata.
- d) Collagen
- e) Integrins
- f) Tight junction

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SLR-MT-677

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017
Zoology
POPULATION GENETICS AND EVOLUTION

Day & Date: Thursday, 23-11-2017
Time: 10.30 AM to 01.00 PM

Max. Marks: 70

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

Q.1 Multiple choice questions(Per question 2 marks): **14**

- 1) Darwin's Finches are example of _____.
a) Reproduction isolation b) Post zygotic isolation
c) Adaptive radiation d) Pre zygotic isolation
- 2) Industrial melanic peppered moth is called _____.
a) Carbonaria b) Glossina
c) Lepsima d) Coptotermis
- 3) Founder principle was proposed by _____.
a) Charles Darwin b) Lamarck
c) Mayr and Shepperd d) Hugo de veris.
- 4) The random changes in gene frequency by chance a small population is called _____.
a) Mutation b) Genetic drift
c) Gene pool d) Genetic drift
- 5) Directional selection produces a shift of the population in one direction due to a _____ in the environment in a particular direction.
a) Change b) Unchanged
c) Constant d) Equilibrium
- 6) Which is the equation of Hardy- Weinberg equilibrium?
a) $P \times q=1$ b) $p \div q=1$
c) $p + q=1$ d) $p - q=1$
- 7) When the population is in genetic equilibrium, the rate of evolution _____.
a) Increase b) Decreases
c) Zero d) Constant

Q.2 Explain the Hardy – Weingberg law of genetic equilibrium with suitable example. **14**

Q.3 Answer the following

- a) Explain principle of Lamarckism. **07**
- b) Describe mechanism of speciation. **07**

Q.4 Explain the following

- a) Natural selection. **05**
- b) Anatomical evidences in evolution. **05**
- c) Darwin Finches. **04**

Q.5 Explain in short :

- a) Describe patterns and mechanism of reproductive isolation. **07**
- b) Give detailed account of destabilizing forces. **07**

Q.6 Write short notes on any four of the following: 14

- a) Germplasm theory.
- b) Industrial melanism.
- c) Evolution in gene family.
- d) Genetic Drift.
- e) Base substitution.
- f) Theory of chemical origin of life.

Q.5 Explain in short :

- a) Describe the Life cycle of *E. gingivalis*. **07**
- b) Structure and life cycle pattern of *Balantidium coli*. **07**

Q.6 Write short notes on any four of the following:

14

- a) Morphology of *Chilomastix mesnili*.
- b) Parasitism in ciliophora.
- c) Morphology of *Trichomonas tenax*
- d) Amoebae of man and domestic animals.
- e) Classification of Protozoa.
- f) Coccidia of poultry with special reference treatment and control.

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M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017
Zoology
MOLECULAR CYTOGENETICS

Day & Date: Thursday, 16-11-2017
 Time: 02.30 PM to 05.00 PM

Max. Marks: 70

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

Q.1 Multiple choice questions. 14

- 1) In Eukayotes Chromatin is formed of _____.
 a) Nucleic acid and proteins
 b) Nucleic acids and carbohydrates
 c) Nucleic acids and lipids
 d) Only nucleic acids
- 2) The linker DNA is associated with _____ histone.
 a) H2A
 b) H2B
 c) H3
 d) H1
- 3) Genetically inactive areas of chromosomes are called _____.
 a) Euchromatin
 b) Heterochromatin
 c) Allochromosome
 d) Telomere
- 4) The intervening nucleotide sequences in DNA are called _____.
 a) Exons
 b) Codons
 c) Histones
 d) Introns
- 5) Monosomic condition is represented by _____.
 a) $2n+1$
 b) $2n-1$
 c) $2n-2$
 d) $2n+2$
- 6) An individual with chromosomes compliment 47,XXY is known as _____ syndrome.
 a) Turner
 b) Klinefelter
 c) Edwards
 d) Down
- 7) The sex ratio of a normal female in Drosophila is _____.
 a) 0.5
 b) 1.0
 c) 1.5
 d) 0.2

Q.2 What is nucleosome? Describe how eukaryotic genome is packed? 14**Q.3 Answer the following.**

- a) Describe the molecular basis of cellular check points during cell cycle. **07**
- b) RFLP. **07**

Q.4 Explain the following.

- a) Describe cytogenetic effects of ionizing radiation. **05**
- b) Transposable elements and their features. **05**
- c) Automated Karyotyping. **04**

Q.5 Explain in short :

- a) Chromosomal Structural aberrations. **07**
- b) Sanger di deoxy method of DNA Sequencing. **07**

Q.6 Write short notes on any four of the following: 14

- a) Transformation in bacteria.
- b) Genetic imprinting.
- c) C-value paradox.
- d) Telomere.
- e) Yeast genome.
- f) PKU.

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Set **P**

M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017
Zoology
BIOCHEMISTRY

Day & Date: Saturday, 18-11-2017
 Time: 02.30 PM to 05.00 PM

Max. Marks: 70

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

Q.1 Rewrite the following sentence by choosing the most correct alternative given below: 14

- 1) The glycan strand of peptidoglycan is made up of _____ and _____.
 a) N-acetylglucosamine, N-acetylgalactosamines
 b) N-acetylglucosamine, N- acetylmuramic acid
 c) N-acetylgalactosamine, N- acetylmuramic acid
 d) N- glucosamine, N-galactosamines
- 2) _____ is complex is used to load the miRNA onto mRNA.
 a) DICER
 b) RISC
 c) σ -factor
 d) Ribosomes
- 3) The entropy of universe always increases is explained by _____ law of thermodynamics.
 a) Zeroth
 b) First
 c) Second
 d) Third
- 4) Citrate is broken down to Acetyl CoA and Oxaloacetate in cytoplasm by _____.
 a) Citrate lyase
 b) Citrate synthase
 c) Acetyl CoA synthase
 d) Aldolase
- 5) NADPH is produced in _____ pathways.
 a) Glycolysis
 b) Purine biosynthesis
 c) Pentose phosphate
 d) TCA cycle
- 6) _____ is common co-enzyme in amino acid metabolism.
 a) Biocytin
 b) Folic acid
 c) UDP
 d) Pyridoxal phosphate
- 7) The catalysts enhance reaction rates by lowering _____ energies.
 a) Activation
 b) Binding
 c) Gibb's free
 d) Free

Q.2 Long Answer Type question 14
 Describe in detail the methods and applications of enzyme immobilization.

Q.3 Answer the following 07
 a) Discuss the reactions of glycolysis. **07**
 b) Explain in detail β -oxidation of fatty acids. **07**

Q.4 Explain the following 05
 a) Structure of DNA. **05**
 b) Energy conservation and release. **05**
 c) Biosynthesis of pyrimidine. **04**

- Q.5 Explain in short :**
- a) Electron transport chain involved in oxidative phosphorylation. **07**
 - b) Site-directed mutagenesis. **07**
- Q.6 Write short notes on any four of the following:** **14**
- a) t-RNA
 - b) Hydrogen bonding
 - c) Energetics of TCA
 - d) Hypoxia
 - e) Abzymes
 - f) Models of cooperativity

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**M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017
Zoology**

COMPARATIVE ANIMAL PHYSIOLOGY

Day & Date: Tuesday, 21-11-2017

Max. Marks: 70

Time: 02.30 PM to 05.00 PM

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

Q.1 Multiple choice questions(Per question 2 marks): **14**

- 1) Uricotelic animals excrete nitrogenous waste in the form of
 - a) Urea
 - b) Uric acid
 - c) Guanine
 - d) Ammonia
- 2) Labor pain is caused due to
 - a) FSH
 - b) Oxytocin
 - c) Thyroid
 - d) LH
- 3) HCL secretions in stomach are stimulated by:
 - a) Gastrin
 - b) Acetylcholine
 - c) Somatostatin
 - d) None of the above
- 4) In circulatory system maximum surface area is seen in:
 - a) Veins
 - b) Capillaries
 - c) Arterioles
 - d) Arteries
- 5) Ultra filtration is occur in
 - a) Glomerulus
 - b) Pyramid
 - c) Collecting duct
 - d) PCT
- 6) Which of the following gases is diffusion limited?
 - a) O₂
 - b) CO
 - c) CO₂
 - d) N₂O
- 7) Maximum oxygen is extracted from blood by:
 - a) Brain
 - b) Liver
 - c) Kidney
 - d) Heart

Q.2 Explain physiology of muscle contraction **14**

Q.3 Answer the following

- a) Describe Communication in bees. **07**
- b) Write note on Bohr's effect. **07**

Q.4 Explain the following

- a) Write a note on circadian rhythms. **05**
- b) Describe the bioluminescence. **05**
- c) Write a note on isoenzymes (LDH) **04**

Q.5 Answer the following

- a) Explain the thermoregulation in poikilothermic animals. **07**
- b) Write a note on chromatophores. **07**

Q.6 Write short notes on any four of the following:

- a) Neural regulation of respiration
- b) Osmoregulation
- c) Physiological significance of sleep
- d) Types of receptors
- e) Neurotransmitters
- f) BMR

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Set **P**

M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017
Zoology
ECONOMIC ENTOMOLOGY

Day & Date: Tuesday, 21-11-2017
 Time: 02.30 PM to 05.00 PM

Max. Marks: 70

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

Q.1	Multiple choice questions(Per question 2 marks):	14
	1) Lac is secreted by _____ gland.	
	a) Dermal gland	b) Salivary gland
	c) Malpighian tubules	d) Hepatic caecae.
	2) Rock bee is species of _____ bee.	
	a) <i>Apis indica</i>	b) <i>Apis dorsata</i>
	c) <i>Apis mellifera</i>	d) <i>Apis florea</i>
	3) Silk protein composed of _____.	
	a) Carbohydrates	b) Fibro-sericin
	c) Glycoprotein	d) Fattiacids
	4) Anopheles transmits _____ in humans.	
	a) Malaria	b) Filarial
	c) Yello fever	d) Rift fever
	5) Borers are found in _____ of plants.	
	a) Leaf	b) Legume
	c) Flower	d) Fruits
	6) Pediculus is _____ of humans.	
	a) Endoparasite	b) Facultative
	c) Ectoparasite	d) Obligatory
	7) Beetles include n order _____.	
	a) Hymenoptera	b) Isoptera
	c) Diptera	d) Coleoptera
Q.2	Long answer type question (Compulsory)	14
	Describe in detail integrated pest management in insect.	
Q.3	Answer the following	
	a) Tics and mites.	07
	b) Paddy grass hopper.	07
Q.4	Explain the following	
	a) Brinjal fruit borer.	05
	b) Modern bee hive.	05
	c) Role of termites.	04
Q.5	Explain in short :	
	a) Hadda beetle	07
	b) Culex mosquito as a vector	07

Q.6 Write short notes on any four of the following:

- a) Pheromones
- b) Fumigants
- c) Khapra beetle
- d) *Pediculus humanis*
- e) Grass hopper
- f) Blow flies

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M.Sc. (Semester - III) (Old) (CBCS) Examination Oct/Nov-2017
Zoology
MOLECULAR CYTOGENETICS

Day & Date: Thursday, 16-11-2017
 Time: 02.30 PM to 05.00 PM

Max. Marks: 70

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

Q.1 Multiple choice questions. (Per question 2 marks)**14**

- 1) In Eukayotes Chromatin is formed of _____.
 a) Nucleic acid and proteins
 b) Nucleic acids and carbohydrates
 c) Nucleic acids and lipids
 d) Only nucleic acids
- 2) Nucleosome core particle is a _____ of basic histones.
 a) Tetramer
 b) Hexamer
 c) Octamer
 d) Decamer
- 3) Genetically inactive areas of chromosomes are called _____.
 a) Euchromatin
 b) Heterochromatin
 c) Allochromosome
 d) Telomere
- 4) The intervening nucleotide sequences in DNA are called _____.
 a) Exons
 b) Codons
 c) Histones
 d) Introns
- 5) Monosomic condition is represented by _____.
 a) $2n+1$
 b) $2n-1$
 c) $2n-2$
 d) $2n+2$
- 6) An individual with chromosomes compliment 47,XXY is known as _____ syndrome.
 a) Turner
 b) Klinefelter
 c) Edwards
 d) Down
- 7) "Buckle out" or compensation loop in normal homologous chromosome is formed during _____.
 a) Duplication
 b) Deletion
 c) Translocation
 d) Inversion
- 8) _____ is virus – mediated bacterial DNA transfer to genetic material.
 a) Transformation
 b) Conjugation
 c) Transduction
 d) Translocation
- 9) The sex ratio of a normal female in Drosophila is _____.
 a) 0.5
 b) 1.0
 c) 1.5
 d) 0.2

Q.2 What is nucleosome? Describe how eukaryotic genome is packed?**14**

- Q.3 Answer the following.**
- a) Describe the molecular basis of cellular check points during cell cycle. **07**
 - b) Describe the Genic balance theory of sex determination? **07**
- Q.4 Explain the following.**
- a) Describe cytogenetic effects of ionizing radiation. **05**
 - b) Transposable elements and their features. **05**
 - c) FISH. **04**
- Q.5 Explain in short :**
- a) Chromosomal numerical aberrations. **07**
 - b) DNA Sequencing by Sanger. **07**
- Q.6 Write short notes on any four of the following: **14****
- a) Transformation in bacteria.
 - b) Imprinting.
 - c) C-value paradox.
 - d) Centromere.
 - e) Yeast genome.
 - f) Sickle cell anaemia.

- Q.5 Explain in short :**
- a) Derivation of Michaeli's-Menten equation. **07**
 - b) Redox potential **07**
- Q.6 Write short notes on any four of the following:** **14**
- a) Tertiary structure of protein.
 - b) Biological energy transducers.
 - c) Hypoxia.
 - d) Energetic of TCA cycle.
 - e) Micro-RNA.
 - f) Phospholipids.