SLR-VN – 1

Seat No.	

M.Sc. – I (Semester – I) Examination, 2014
(C.G.P.A. Pattern)
ZOOLOGY
Biosystematics (Paper – I)

Day and Date : Monday, 21-4-2014 Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

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

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

1) The group is considered polyphyletic if _____
   a) All members of the group share a common ancestor
   b) Not all descendants of the common ancestor are included
   c) All members share homoplastic traits
   d) The group does not contain the most recent common ancestor

2) Characteristics between the branch points of a cladogram that are shared by all organisms above the branch point and are not present in any below it are called _____
   a) Homologous characters b) Ancestral characters
   c) Derived characters d) Novel characters

3) _____ has an important advantage in all types of phylogenetic research due to high level of variability and a high rate of mutation.
   a) Nuclear DNA b) Mt DNA
   c) rRNA d) None of these

4) _____ classification of species, subspecies and populations, are the measures of phylogenetic diversity.
   a) Evolution b) Genetic c) Phylogenetic d) None of these

5) The Swedish botanist _____ is called as the father of taxonomy.
   a) Aristotle b) John Ray
   c) Shen Nung d) Carolus Linnaeus

P.T.O.

6) _____ is a phylogenetic tree that represents evolutionary time through its branch spans.
   a) Dendrogram b) Chronogram c) Phylogram d) Cladogram

7) All species in a grouping share a common ancestor and all species derived from a common ancestor called as _____
   a) Monophyletic b) Paraphyletic c) Polyphyletic d) None of these

2. Long answer type question : **14**

   Give an account on structural organization of tissues, organs and systems.

3. Answer the following :

   A) Biological mechanism genetic incompatibility **7**

   B) Cytotaxonomy. **7**

4. Explain the following :

   A) Merits and demerits of taxonomical keys. **5**

   B) Conservation of diversity. **5**

   C) Distance method of Phylogenetic inference. **4**

5. Explain in short :

   A) Kinds of systematic publications. **7**

   B) Collection and preservation process of identification. **7**

6. Write short notes (**any four**) : **14**

   1) Restriction enzyme sites
   2) DNA hybridizations
   3) Nucleic acid sequences
   4) Typification process
   5) Molecular taxonomy
   6) Parsimony methods of Phylogenetic inference.

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SLR-VN – 10

Seat No.	

M.Sc. (Part – II) (Semester – III) Examination, 2014
ZOOLOGY (Paper – X)
Wild Life and Conservation Biology

Day and Date : Wednesday, 23-4-2014 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1) Question **1** and **2** 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. Select the correct alternative : **20**

1) National Environmental Engineering Research Institute is at _____
   a) Bijapur b) Kanpur c) Nagpur d) Pune

2) The intermediate transitional zone between two ecological communities is known as _____
   a) Ecology b) Exobiology
   c) Ecotone d) All the above

3) The food chain which starts from microorganisms is _____
   a) predator food chain b) detritus food chain
   c) grazing food chain d) all above

4) The most productive ecosystem in the biosphere is _____
   a) River b) Open ocean
   c) Estuary d) All above

5) _____ will give a complete list of all endangered animals and plants in the country for the first time.

a) Red Data Book b) WWF

c) National Wildlife Action Plan d) World Education Book

6) IUCN stands for _____

a) International Unity on Community and Nationality

b) Indian Union Congress Nation

c) International Union for the Conservation of Nature and Natural Resources

d) Inter-state Unity of Culture Nature

7) Ecological niche parameters are affected by _____

a) Competition

b) Available resources

c) Predation

d) All of them

8) An ecological pyramid of biomass is a representation of the ecosystem's _____

a) population in each food web

b) energy flow through each tropic level

c) biological material in relation to abiotic material

d) individuals at each tropic level

9) Cryopreservation involves storage of cells from embryos and shoot tips in liquid nitrogen at _____

a) 0°C b) 5°C c) –196°C d) 100°C

10) In ecology, a _____ is a *statistic* which is intended to measure the biodiversity of an ecosystem.

a) population b) diversity index

c) correlation d) sampling

SECTION – II

2. What is Tsunami ? Give an account on effect of Tsunami in ecosystem. **20**

3. A) What is ecosystem ? Describe the biotic and abiotic components of ecosystem. **10**

   B) Discuss the energy flow in an ecosystem. **10**

4. What are the modern conservational practices ? Comment on captive breeding of endangered species. **20**

5. A) Give an account on Earth Summit Agenda. **10**

   B) Describe renewable and nonrenewable natural resources. **10**

SECTION – III

6. Write short notes on **any four** of the following : **20**

   a) Food chain and food web

   b) Indices of diversity

   c) Modern fishing methods

   d) Ecotone

   e) Desert biome

   f) Anthropological effects on Ecosystem.

SLR-VN – 11

Seat No.	

M.Sc. (Part – II) (Semester – III) Examination, 2014
ZOOLOGY
Paper – XI : Comparative Animal Physiology

Day and Date : Friday, 25-4-2014 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

1. Multiple choice questions :

1) 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) Hypothalamic thermostat is the set point at
   A) 37°C B) 38°C
   C) 90°C D) 39°C

3) Acclimatization of sweating mechanism
   A) increases loss of NaCl in sweat
   B) occurs due to decreased aldosterone secretion
   C) increases rate of sweating
   D) occurs on chronic exposure to hot weather

4) Emptying of stomach

A) depends on intensity of mixing waves

B) is inhibited by gastrin

C) is stimulated by enterogastric reflex

D) all the above

5) Quantity of gastric juice secreted per day is

A) 2000 to 3000 ml B) 500 to 1000 ml

C) 100 to 200 ml D) 5 to 7 L

6) Which of the following muscle is most important for inspiration ?

A) external intercostals B) abdominal

C) scalene D) diaphragm

7) In normal person the maximum expiratory flow is

A) 400 liters/minute B) 100 liters/minute

C) 500 liters/minute D) 200 liters/minute

8) Central chemoreceptors

A) are located in pons

B) are sensitive to changes in PCO_2

C) are located in carotid bodies

D) are stimulated by decrease in blood PO_2

9) Rapid eye movement sleep

A) occurs for greater duration in adults

B) total time is 1.5 to 2 hours in a day in adults

C) is associated with delta waves in EEG

D) is associated with increased muscle tone

10) Slow wave sleep

A) forms the major part of sleep in adults

B) is associated with decreased muscle tone

C) is associated with decreased heart rate

D) all the above

SECTION – II

2. Illustrate patterns of nitrogen excretion among different animal groups. **20**

3. a) Describe different modes of feeding mechanism in animals. **10**

   b) Explain physiology of respiratory pigments in different phylogenetic groups. **10**

4. a) Comment on Poikilotherms and Homeotherms with suitable examples. **10**

   b) Describe the physiology of urine formation. **10**

5. Explain physiology of visual perception. **20**

SECTION – III

6. Write short note on (**any four**) : **20**

   A) Microtubules

   B) Physiology of sleep

   C) Reproductive cycles

   D) Neurotransmitters

   E) Chromatophores.

SLR-VN – 12

Seat No.	

M.Sc. (Part – II) (Semester – III) Examination, 2014
ZOOLOGY (Paper – XII)
Biochemistry

Day and Date : Monday, 28-4-2014 Max. Marks : 100

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

N.B.: *1) Attempt in **all five** questions.*

*2) Answers to the **all** Sections are to be written in the **same** answer-book.*

*3) Write biochemical reactions **wherever** necessary.*

*4) Figures to the **right** indicate **full** marks.*

*5) Question No. **2** is **compulsory**. Attempt **any two** questions from question No. **3, 4** and **5**.*

SECTION – I

1. Write following sentences selecting correct answer from given options. **(2×10=20)**

i) _____ disaccharide is known as milk sugar.

a) Glucose b) Ribose c) Lactose d) Sucrose

ii) DNA helix is left handed in _____ DNA.

a) A b) B

c) Single stranded d) Z

iii) Since cell exchanges matter with surrounding, it is a _____ system.

a) open b) closed c) adiabatic d) isothermal

iv) Energy rich compounds like ATP, $FADH_2$, NADH contain _____ base in their structure.

a) cytosine b) guanine c) adenine d) thymine

P.T.O.

v) ATP is converted to cyclic AMP by enzyme

a) alkaline phosphatase b) adenylate cyclase

c) protein kinase d) glycogen phosphorylase

vi) For oxidation of fatty acids, they are transported into mitochondria by _____ molecule.

a) carnitine b) oxaloacetate c) coenzyme A d) C_0Q_{10}

vii) The basis of classification of enzymes by enzyme commission is _____ the enzymes.

a) source of b) molecular weight of

c) structure of d) types of the reaction catalysed by

viii) _____ cells entrapped in alginate gel are used for commercial production of ethanol.

a) Aspergillus niger b) Penicillium notatum

c) Aspergillus oryzae d) Saccharomyces cereviceae

ix) _____ is not a steroid hormone.

a) Testosterone b) Estradiol

c) Glucagon d) Aldosterone

x) Michaelis-Menten equation is for ____ reactions.

a) one substrate, one product b) one substrate, two products

c) two substrates, one product d) two substrates, two products

SECTION – II

2. Discuss in detail the regulation of enzyme activity by various non genetic mechanisms. **20**

3. a) Illustrate primary, secondary, tertiary and quaternary structures of protein. Add a note on functions of protein. **10**

b) Write and describe all reactions of biosynthesis of pyrimidine bases. **10**

4. a) With biochemical reactions discuss the biosynthesis of fatty acids and triglycerides. **10**

   b) Discuss various common reactions of amino acid metabolism. **10**

5. a) What is site directed mutagenesis ? How can it be used in enzyme engineering ? **10**

   b) Explain clover-leaf structure of t-RNA and differentiate between DNA and RNA. **10**

SECTION – III

6. Write notes on **any four** from below : **(4×5=20)**

   a) Watson and Crick model of DNA

   b) Energy rich compounds

   c) β-oxidation of fatty acids

   d) Immobilization of enzyme by physical adsorption

   e) Mechanism of enzyme catalysis

   f) Metabolic regulation during hypoxia.

SLR-VN – 13

Seat No.	

M.Sc. (Part – II) (Semester – IV) Examination, 2014
ZOOLOGY (Paper – XIII)
Animal Biotechnology

Day and Date : Tuesday, 22-4-2014 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

1. For each unit 2 marks : **20**

1) Bt Cotton is
   a) Cloned plant b) Transgenic plant
   c) Hybrid plant d) Mutated plant

2) Eco RI is an
   a) Ligase b) Polymerase
   c) Restriction enzyme d) Gyrase

3) Genes involved in turning on or off the transcription of an operon are _____
   a) Polymorphic genes b) Operator genes
   c) Redundant genes d) Regulatory genes

4) Variations observed during tissue culture of some plants are known as
   a) Clonal variations b) Somatic variations
   c) Somaclonal variations d) Tissue culture variations

5) A technique of using very small metal particles coated with desired gene in the gene transfer is called
   a) Electroporation b) Microinjection
   c) Liposome d) Biolistics

6) E. Coli hydrolases lactose into glucose by _____
   a) B-galactosidase b) Permease
   c) Transacetylase d) All the above
7) Formation of protein from mRNA is called
   a) Transformation b) Transduction c) Translation d) Transcription
8) The codons which may present at 3' end of mRNA
   a) UAA b) UAG c) UGA d) Any one of these
9) In recombinant DNA technology a plasmid vector is cleaved by
   a) Modified DNA ligase
   b) A heated alkaline solution
   c) The same enzyme that cleave the donor DNA
   d) The different enzyme other than cleave the donor DNA
10) Commonly used bacterium for genetic transformation in the plants is
   a) *E. Coli* b) *Agrobacterium ruzogene*
   c) *Agrobacterium tumifaciens* d) *Erumia caratovora*

SECTION – II

2. Describe the principles and methods involved in Gene transfer in rDNA technolgy. **20**

3. A) Explain the molecular cytogenetic PCR. **10**
   B) What is GISH ? Comment on the role of hybridization. **10**

4. A) Describe the methods in sequencing of nucleic acid, DNA. **10**
   B) What is cell culture ? Add a note on stem cells and their role. **10**

5. Enumerate the steps in protein synthesis in prokaryotes. **20**

SECTION – III

6. Write short notes on **any four** of the following : **20**
   a) Post translational modification
   b) Cybrids
   c) FISH
   d) Allelopathy
   e) Cot curve
   f) Micropropagation.

_____

SLR-VN – 14

Seat No.	

M.Sc. (Part – II) (Semester – IV) Examination, 2014
ZOOLOGY (Paper – XIV)
Applied Zoology

Day and Date : Thursday, 24-4-2014 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) Question **2** and **6** is **compulsory**.*
*2) Attempt **any two** questions from questions **3**, **4** and **5**.*
*3) 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. For **each** Unit **2** marks. **20**

1) 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

2) _____ is nutrient rich, natural fertilizer and soil conditioner.
   a) Urea b) Vermicompost
   c) Indol acetic acid d) All above

3) _____ are more antigenic.
   a) Polysaccharides b) Proteins
   c) Lipids d) Nucleic acid

4) Monoclonal antibodies are produced by _____
   a) Hybridoma technology
   b) PCR technique
   c) HPLC technique
   d) Attenuation technique

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

6) Lymphocytes that cause the formation of holes in plasma membrane are _____
   a) B cells
   b) Killer T cells
   c) Suppressor T cells
   d) Helper T cells

7) Amniotic fluid is often obtained using a long syringe, guided by _____
   a) Electron microscope
   b) Spectroscope
   c) Ultrasound
   d) All above

8) Ex situ conservation of genetic material from livestock and fish through _____ is an important strategy.
   a) Conservation
   b) Cryopreservation
   c) Communication
   d) Preservation

9) The intrauterine devices are used to prevent _____
   a) The sperm to reach egg
   b) The sperm from leaving
   c) The sperm to reach female
   d) All above

10) Cryopreserved gametes or embryos are frozen and maintained under _____
   a) Liquid nitrogen
   b) DMSO
   c) Liquid paraffin
   d) Frozen ice

SECTION – II

2. Write an essay on 'Biological Warfare'. **20**

3. A) Give an account on routine tests of blood for hepatitis. **10**

   B) Give an account on Vermiculture. Add a note on Earthworm as a protein source. **10**

4. Give a detailed account on IVF. **20**

5. What is amniocentesis. Add a note on merits and demerits of amniocentesis. **20**

SECTION – III

6. Write short notes on **any four** of the following : **20**

   a) Cryopreservation

   b) Molecular basis of host parasitic interaction

   c) Semen analysis

   d) Surrogate pregnancy

   e) Polyclonal sera

   f) Antigen antibody reaction.

SLR-VN – 15

Seat No.	

M.Sc. (Part – II) (Semester – IV) Examination, 2014
ZOOLOGY (Paper – XV)
Environmental Biology and Toxicology

Day and Date : Saturday, 26-4-2014 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

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

SECTION – I

For **each** unit **2** marks.

1. MCQ : **20**

1) _____ is known as Primary community.
   a) Primary colonizer b) Pioneer
   c) Nudation d) Both a and b

2) The first group of organisms establishing in basic environment is known as
   a) autogenic succession b) autotriphic succession
   c) primary community d) heterotrophic succession

3) Pioneer of Chipko movement is
   a) Baba Amte b) Mohan Dhariya
   c) Medha Patkar d) Sunderlal Bahuguna

4) Which one of the following is not a component of plant species of a hydrosere
   a) Rooted submerged stage b) Herb stage
   c) Rooted floating stage d) Red-swamp stage

5) *E.coli* is an indicator of
   a) air pollution b) water pollution c) soil pollution d) all above

P.T.O.

6) Which of the following air pollutants is a major contributor in acid rain ?
   a) CH_4 b) CO c) SO_2 d) CO_2

7) In Y-shaped energy flow model one arm represents the herbivore food chain, while other arm represents
   a) carnivore food chain b) primary consumer food chain
   c) detritus food chain d) all the above

8) The best technique adopted for solid waste
   a) land fill b) land disposal
   c) vermicomposting d) incineration

9) _____ is Caramel.
   a) food preservative b) food color
   c) artificial sweetener d) flavor enhancer

10) Biotic community is composed of a collection of
   a) ecosystems b) food webs
   c) closely related species d) interacting populations

SECTION – II

2. Describe in detail Noise pollution. Add note on effects of noise pollution on health. **20**

3. A) What are Toxicants ? Add a note on household toxicants. **10**

   B) Give an account on Biological indicators of pollution. **10**

4. State energy flow in ecosystem and describe the 'Y' shaped energy flow model. **20**

5. What is waste management ? Describe with respect to solid waste management. **20**

SECTION – III

6. Write short notes on **any four** of the following : **20**
   a) Food additives
   b) Plastic waste
   c) Minamata disease
   d) Grassland Ecosystem
   e) Water conservation method
   f) Toxic agents in household use.

SLR-VN – 16

Seat No.	

M.Sc. (Part – II) (Semester – IV) Examination, 2014
ZOOLOGY (Paper – XVI)
Zoo Keeping and Animal House Management

Day and Date : Tuesday, 29-4-2014 Max. Marks : 100

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

***Instructions**: 1) Question **1** and **2** are **compulsory**.*
*2) Attempt **any two** questions from questions **3,4** and **5**.*
*3) 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) Spoilling of zoo by physical and chemical factors is termed _____ **20**
   a) Contamination
   b) Adulteration
   c) Poisoning
   d) Pollution

   2) Cryopreservation involves strorage of gamets in liquid nitrogen at ____
   a) 0°C
   b) 5°C
   c) –196°C
   d) 100°C

   3) Identification of missing zoo tiger in wild can be done with _____
   a) Pug marks
   b) Dentition
   c) Band pattern and a photograph
   d) Fingerprints

P.T.O.

4) A crocodile can be differentiated from alligator by _____
   a) Prominent protruding fourth tooth in upper jaw
   b) Broad snout
   c) Short jaw
   d) Smaller size

5) In India crocodile breeding centre is located in _____
   a) Kolkata
   b) Chennai
   c) Chilica Lake
   d) Tiruvanantpuram

6) Ethogram is a _____
   a) Pictorial catalogs of the behavioural patterns of an organism or a species
   b) Graphical representation of behaviour
   c) Statistical representation of behaviour
   d) All of above

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

8) Rabies is a zoonotic _____ disease which infects domestic and wild animals.
   a) Viral
   b) Bacterial
   c) Hematic
   d) Helminth

9) Transmittable diseases from wild birds to poultry and to the human being is _____
   a) SARS
   b) Influenza
   c) Rabies
   d) Typhoid

10) Visceral leishmaniasis (VL), also known as _____

a) Kala azar
b) Sleeping sickness
c) Bird flu
d) Mad cow disease

SECTION – II

2. What is taxidermy ? Give its importance. How taxidermist prepares head, skin and fish mounts ? **20**

3. A) Give an account on Management of grain eater birds. **10**

   B) How to prevent infection of Mammals ? **10**

4. What are common avian disease ? How they are transmitted to domestic animals ? **20**

5. What are the vistor rules, regulations and surveillance in a zoo. Give an account on first aid to the zoo animals and visitors ? **20**

SECTION – III

6. Write short notes on **any four** of the following : **20**

   a) Firefighting in National Parks
   b) Special precautions for keeping snakes in zoo
   c) Bird feeds
   d) Zoo design
   e) Public awareness programmes in a zoo
   f) Zoo Tourism.

SLR-VN – 2

Seat No.	

M.Sc. (Part – I) (Semester – I) Examination, 2014
ZOOLOGY (Paper – II) (C.G.P.A. Pattern)
Tools and Techniques in Biology

Day and Date : Wednesday, 23-4-2014 Total Marks : 70
Time :11.00 a.m. to 2.00 p.m.

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

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

1) Best separation of essential oil can be achieved by _____
   a) HPLC b) TLC
   c) Gas Liquid Chromatography d) Electrophoresis

2) Commonly used gel for cell immobilization is _____
   a) Agar b) Alginate
   c) Sodium silicate d) Sephadex

3) X-ray crystallography is used to elucidate the following _____
   a) Crystal structure b) Graphical presentation of X-rays
   c) X-ray photography d) X-ray treatment of plants

4) Numerical aperture is related to _____
   a) Black hole
   b) Digital data
   c) Resolving power of microscope
   d) Size of sample for TEM

5) Genomic library is library of _____
   a) Gene related books b) DNA fragment of a genome
   c) Lab working on genes d) Place where genes are stored

6) ELISA is used for _____
   a) Separate viral RNA b) Purify proteins
   c) Isolate DNA d) Identify specific proteins

7) The best technique to separate isoenzymes is _____
   a) Paper chromatography b) Electrophoresis
   c) Microscopy d) Thin layer chromatography

P.T.O.

2. Discuss the design and functioning of tissue culture laboratory. **14**

3. A) How are X-rays used in biology ? **7**

   B) Comment on the uses of radioisotopes. **7**

4. Explain the following :

   A) Centrifugation. **5**

   B) NMR. **5**

   C) Hybridoma. **4**

5. A) Explain in short the steps in construction of Recombinant DNA. **7**

   B) Explain in short immunoassay. **7**

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

   1) Flow cytometry
   2) Affinity adsorption
   3) Geigometry
   4) Autoradiography
   5) ECG
   6) Cryopreservation.

SLR-VN – 3

Seat No.	

M.Sc. – I (Semester – I) Examination, 2014
ZOOLOGY
Cell and Molecular Biology (Paper – III)
(C.G.P.A. Pattern)

Day and Date : Friday, 25-4-2014 Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

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

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

1) _____ is the cytoskeletal element having the largest diameter.
   a) Microfilaments b) Microtubules
   c) Intermediate filaments d) None of the above

2) The important cell cycle system is a family of protein kinases known as _____
   a) G_1 cyclin b) Cyclin dependent kinases
   c) S cyclins d) M cyclin

3) Peroxisomes contain enzymes related to the metabolisms of _____
   a) H_2O_2 b) β-oxidation
   c) a) and b) d) None of the above

4) The diameter of entire metaphase chromosome is about _____
   a) 1.0 μm b) 0.4 μm c) 0.6 μm d) 0.3 μm

5) Free radicals are highly reactive due to presence of a/an _____
   a) Electron b) Unpaired electron
   c) Paired electron d) None of above

6) Mutations in the broad classes of genes have been implicated in the onset of cancer are _____
   a) Proto-oncogene b) Tumor-suppressor gene
   c) a) and b) d) All of the above

7) Total number of histone proteins is _____
   a) Two b) Three c) Four d) Five

P.T.O.

2. Describe the structure and functions of mitochondria and add note on components on respiratory chain. **14**

3. A) Explain the role of cyclins and cyclin dependent protein kinase in cell cycle control. **7**

   B) Write note on glycosaminoglycans. **7**

4. A) Write short note on plasmodesmata. **5**

   B) Define aging and give note on cellular mechanism of aging. **5**

   C) Give the structure and function of intermediate filament. **4**

5. A) Give the structure and function of nucleus. **7**

   B) Give an account on auxins and cell expansion. **7**

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

   1) Collagens
   2) Causes of cancer
   3) Polysomes
   4) Structure and function of cilia
   5) Chemical synapses
   6) Cell-cell fusion in abnormal cell.

SLR-VN – 4

Seat No.	

M.Sc.I (Semester –I) (C.G.P.A. Pattern) Examination, 2014
ZOOLOGY (Paper – IV)
Population Genetics and Evolution

Day and Date : Monday, 28-4-2014 Max. Marks : 70

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

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

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

1) A new species can arise in a single generation
   a) If allopatric speciation occurs
   b) In a very large population that is spread over a large area
   c) Through geographical isolation
   d) If a change in chromosome number creates a reproductive barrier

2) Which of the following conditions can result in evolution in a population ?
   a) All mating is totally random
   b) Mutation is not occurring
   c) Natural selection is not occurring
   d) None of the above

3) Sympatric speciation is _____
   a) The appearance of a new species in the same area as the parent population
   b) Initiated by the appearance of a geographical barrier
   c) The emergence of many species from a single ancestor
   d) All the above

4) Which of the following is the first step in allopatric speciation ?
   a) Genetic drift
   b) Hybridization
   c) Geographical isolation
   d) Polyploidy

P.T.O.

5) The evolution of numerous species, such as Darwin's finches, from a single ancestor is called _____
   a) Sympatric speciation
   b) Adaptive radiation
   c) Nondisjunction
   d) Gradualism

6) According to the _____ model, evolution occurs in spurts; species evolve relatively rapidly, then remain unchanged for long periods.
   a) Nondisjunction
   b) Gradualist
   c) Punctuated equilibrium
   d) Adaptive radiation

7) Two animals are considered of different species if they _____
   a) Are geographically isolated
   b) Look different
   c) Live in different
   d) Cannot interbreed

2. Give an account on Patterns of change in nucleotide and amino acid sequences. **14**

3. Answer the following :
   A) Give an account on Molecular analysis of quantitative traits. **7**
   B) Describe Phylogenetic and biological concept of speciation. **7**

4. Explain the following :
   A) Why small populations become extinct ? Explain. **5**
   B) The evolutionary time scale. **5**
   C) Migration **4**

5. A) Give an account on Emergence of Neo-Darwinism-neutral hypothesis. **7**
   B) Give an account on Concepts of evolution and theories of organic evolution. **7**

6. Short notes (**any four**) : **14**
   1) Adaptation
   2) Patterns of change in nucleotide and amino acid sequences
   3) Darwin-concepts
   4) Factors affecting human disease frequency
   5) Estimation of heredity
   6) Sympatric Speciation.

SLR-VN – 5

Seat No.	

M.Sc. (Part – I) (Semester – II) Examination, 2014
ZOOLOGY (Paper – V) (New)
(C.G.P.A. Pattern)
Computational Biology

Day and Date : Tuesday, 22-4-2014 Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions *: 1) Questions **1**, **2** and **6** is **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**.*

1. Multiple choice questions : **14**

1) Median of data 10, 18, 17, 19, 10, 15, 11, 17, 12 is _____
   a) 10 b) 17 c) 15 d) 12

2) t' test is used for testing _____
   a) Sample mean b) Population mean
   c) Sample variance d) Population variance

3) If X ~ B (np) then the distribution of Y = (n – x) is _____
   a) B(n, p) b) B(n, x) c) B(n.q) d) B(n, 1)

4) In general there are _____ lines of regression.
   a) 3 b) 2 c) 4 d) More than 4

5) If A and B are mutually exclusive, then P(A ∩ B) = _____
   a) p(A) * P(B) b) One
   c) P(B) d) Zero

6) _____ is defined as square of the arithmetic mean of the squares of the deviation from the mean
   a) Correlation b) Standard deviation
   c) Z test d) Dispersion

7) For a perfect positive correlation the value of correlation 'r' = _____
   a) +1 b) +0.9 c) –1 d) –0.9

P.T.O.

2. What is hypothesis testing ? Explain the procedure of testing with example for large sample. **14**

3. Explain :

   A) What is Karl Pearson coefficient of correlation ? How will you interpret the value of 'r' ? **7**

   B) A bag contains 30 balls numbered 1 – 30. One ball is drawn at random. Find the probability that the number of ball drawn will be a multiple of 5 or 7. **7**

4. Explain :

   A) Define standard deviation. State the difference between mean deviation and standard deviation. **5**

   B) Define chi square test of goodness of fit. **5**

   C) Define dispersion and mention the objectives of measuring dispersion. **4**

5. Explain :

   A) Calculate the Karl Pearson coefficient of correlation. **7**

   X = 32, 55, 49, 60, 43, 37, 43, 49, 10, 20

   Y = 40, 30, 70, 20, 30, 50, 72, 60, 45, 25.

   B) Write the properties of 't' distribution. **7**

6. Write short notes **any 4** : **14**

   1) Objectives of average and requirements of good average
   2) Scatter diagram
   3) Significance of 't' test
   4) Binomial distribution
   5) Spearman's rank correlation
   6) Uses of chi square test.

SLR-VN – 6

Seat No.	

M.Sc. (Part – I) (Semester – II) Examination, 2014
ZOOLOGY (Paper – VI) (New) (CGPA Pattern)
General and Comparative Endocrinology

Day and Date : Thursday, 24-4-2014 Max. Marks : 70
Time : 11.a.m.to 2.00 p.m.

Instructions** : 1) Question **1** and **2** 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 **full** marks.*

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

1) Ecdysone hormone is responsible for_____ during metamorphosis.
   a) Moulting b) Feeding
   c) Excreting d) Reproducing

2) _____ hormone indicates birds for migration.
   a) Gastrin b) Gonadal
   c) Secretin d) Juvenile

3) _____ harmone is secreted from post lobe of pituitary gland.
   a) Pancreatic b) ACTH
   c) Vasopressin d) Thyroxin

4) _____ cell nourishes the sperm in test is
   a) Islets of Langerhans b) Leydig cell
   c) Hepatic cell d) Sertoli cell

5) Human sperm acrosome contains _____ enzyme.
   a) Protease b) GH amylase
   c) Lipase d) Hyaluronidase

P.T.O.

6) Cretins are individuals who suffer from a deficiency of total absence of _____
   a) Insulin b) Thyroid Hormone
   c) Glucagon d) Follicle stimulating Hormone

7) _____ hormone is responsible for coloration.
   a) MSH b) PTH c) GH d) FSH

2. Long answer type question compulsory : **14**

Explain in detail male reproductive system and biosynthesis of steroid hormone.

3. Answer the following :

A) Homeostasis **7**

B) Hormonal role in Menstrual cycle. **7**

4. Explain the following :

A) Colour changing hormone-MSH. **5**

B) Hormones in Parturation. **5**

C) Discovery of Hormones. **4**

5. Explain in short :

A) Role of hormones in metamorphosis. **7**

B) Hormones of gastrointestinal tract. **7**

6. Short notes **(any four)** : **14**
   1) Peptide hormone
   2) Functions of leydig cells
   3) Functions of progesterone
   4) Hormonal effect on fear and aggressive behaviour
   5) Lactation
   6) Prostaglandin.

_____

SLR-VN – 7

Seat No.	

M.Sc. – I (Semester – II) Examination, 2014
ZOOLOGY (New) (C.G.P.A. Pattern)
Paper No. VII : Developmental Biology

Day and Date : Saturday, 26-4-2014 Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

***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) Embryonic stem cells are derived from _____
   a) Blastocyst b) Gastrula
   c) Ectoderm d) All three germ layers

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

P.T.O.

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) Choronology

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 gastrulation in mammals. **14**

3. Answer the following :
   A) Acrosome reaction. **7**
   B) Structure of hen's egg. **7**

4. Explain the following :
   A) Cloning with an example. **5**
   B) Regeneration in hydra **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 the type studied. **7**

6. Short notes (**any four**) : **14**
   1) Stem cells
   2) Vitellogenesis
   3) Ceavages in Frog
   4) Cortical reaction
   5) Prevention of polyspermy
   6) Emboly.

_____

SLR-VN – 9

Seat No.	

M.Sc. (Part – II) (Semester – III) Examination, 2014
ZOOLOGY (Paper – IX)
Molecular Cytogenetics

Day and Date : Monday, 21-4-2014 Total Marks :100
Time : 3.00 p.m to 6.00 p.m.

Instructions *:1) Question **2** from Section **II** is compulsory*
2) Attempt **any two** *questions from **3**, **4**, **5**.*
*3) Section **I**, **II** and **III** are to be written in the **same** answer book.*
*4) Draw neat labelled diagram **wherever** necessary.*
*5) Figures to the **right** indicate marks.*

SECTION – I

1. 1) What is added to the 3′-end of many eukaryotic mRNAs after transcription ? **20**
   A) Introns
   B) A poly A tail
   C) A cap structure, consisting of a modified G nucleotide
   D) The trinucleotide 5′-CCA

   2) Which of the following is NOT a feature of eukaryotic gene expression ?
   A) Polycistronic mRNAs are very rare
   B) Many genes are interrupted by noncoding DNA sequences
   C) RNA synthesis and protein synthesis are coupled as in prokaryotes
   D) mRNA is often extensively modified before translation

   3) RNAs that catalyze biological reactions, such as self-splicing introns, are known as :
   A) Enzymes
   B) Spliceosomes
   C) Ribosomes
   D) Lariats

P.T.O.

4) The regions of DNA in a eukaryotic gene that encode a polypeptide product are called

A) hnRNAs B) exons

C) enhancers D) leader sequences

5) mRNA will form hybrids only with the coding strand of DNA because

A) DNA will not reanneal at high temperatures

B) The salt concentration will affect DNA reannealing

C) DNA will not reanneal at low temperatures

D) RNA : DNA hybridization follows the base-pairing rules

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) _____ technique helps to visualise the chromosomes.

A) DNA finger printing

B) Automated sequencing

C) Chromosome painting

D) Hybridisation

8) The sex ratio of a normal female is

A) 0.5 B) 1.0

C) 2.0 D) 0.0

9) Barr bodies are found in _____

A) Both males and females B) Females only

C) Males only D) Supermales

10) In Drosophila sex is determined by

A) X and Y chromosomes B) X/A ratio

C) Ploidy D) Z and W chromosomes

SECTION – II

2. How sex is determined in Drosophila ? Explain dosage compensation in Drosophila. **20**

3. A) Explain the molecular cytogenetic technique chromosome painting and give its application. **10**

   B) What is cancer ? Comment on the role of Oncogenes. **10**

4. Describe cytogenetics implications and consequences of numerical aberrations of chromosomes. **20**

5. What is C Value paradox ? Explain eukaryotic genome organization of genes in chloroplast genome. **20**

SECTION – III

6. Write short notes on **any four** of the following : **20**

   a) GISH

   b) Bacterio phage structure

   c) Telomere and its importance

   d) GenomeImprinting

   e) Yeast Genome

   f) Satellite DNA.