

Master of Science – I (Zoology) Examination: Oct / Nov 2016
Semester – I (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN – 715	Wednesday 16/11/2016	10.30 AM to 01.00 PM	Biosystematics	HCT 1.1	

Instructions: 1) Q.1, 2 & 6 are compulsory.
 2) Answer any two questions from Q.3, 4 & 5

Total Marks:70

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

- 1) The correct sequence of taxa is _____
 - a) Class-Order-Family-Genus-Species
 - b) Class-Order-Tribe-Family-Genus-Species
 - c) Phylum-Order-Class-Tribe-Genus
 - d) Phylum-Tribe-Class-Order-Genus-Species

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

- 3) In _____ International Congress of Zoology organized an International Commission on Zoological Nomenclature to formulate a set of rules.
 - a) 1964
 - b) 1984
 - c) 1865
 - d) 1898

- 4) Ichthyology is the study of _____
 - a) Fishes
 - b) Viruses
 - c) Mammals
 - d) Amphibians

- 5) _____ is known as Father of Biological Taxonomy.
 - a) Otto Brulfels
 - b) Mendel
 - c) Cesalpino
 - d) Aristotle

- 6) Taxonomy is the Science of _____
 - a) Identification
 - b) Survey
 - c) Group
 - d) Classification and Nomenclature

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

Q.2 What is Speciation? Describe the mechanism of Speciation. 14

Q.3 Answer the following: 07

- A) How to Construct Phylogenetic Trees? 07
- B) Applications of Biosystematics. 07

Q.4 Explain the following: 05

- A) Merits and demerits of taxonomical keys. 05
- B) Chemotaxonomy 05
- C) Binomial Nomenclature 04

Q.5 Explain in short:	
A) Process of Typification of different Zoological Types	07
B) Molecular taxonomy	07
Q.6 Write short notes on any Four of the following:	14
1) International Code of Zoological Nomenclature	
2) Systematic publications	
3) Process of Typification	
4) DNA-DNA Hybridization	
5) Parsimony methods of Phylogenetic inference	
6) Historical resume of Systematic	

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SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN 716	Friday 18/11/2016	10:30 AM to 01:00 PM	Tools And Techniques In Biology	HCT 1.2	

Instructions: 1) Q.1, 2 & 6 are compulsory.
2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

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

- 1) _____ generate free radicals of acrylamide.
 - a) TEMED
 - b) Acrylamide
 - c) Ammonium per Sulphate
 - d) Agarose

- 2) Sample dissolved in glycine Chloride buffer at P^H 8-9 _____ in the upper buffer exists as zwitterions.
 - a) Chloride
 - b) Protein sample
 - c) Glycine
 - d) both a & b

- 3) More recently a term immunoblotting is introduced in _____ technique.
 - a) Southern blotting
 - b) Western blotting
 - c) Northern blotting
 - d) All of above

- 4) The radioactive element used to study newly synthesized protein is _____.
 - a) Sodium
 - b) Chlorine
 - c) Nitrogen
 - d) Potassium

- 5) All the following are components of compound microscope except _____.
 - a) stage clips
 - b) fine adjustment
 - c) electron gun
 - d) Binocular eye piece

- 6) Hybridomas are produced by fusion of _____.
 - a) Selected lymphocytes
 - b) lymphocytes & tumour cell
 - c) Tumour cells & Hela cells
 - d) Hela cells & plants cells

- 7) The locating agent of amino acid is _____.
 - a) Diazo reagent
 - b) Amphoteric oxides
 - c) Neutral acids
 - d) Ninhydrin spray

Q.2 What is Chromatography? Describe the principle of column chromatography and its applications. 14

Q.3 Answer the following:	
A) Design and functioning of tissue culture laboratory.	07
B) Freeze Drying and freeze fracturing technique.	07
Q.4 Explain the following:	
A) DNA cloning	05
B) Cell Hybrids and its Application	05
C) X-rays in Biology	04
Q.5 Explain in short:	
A) Cryotomy	07
B) Radiolabel techniques in biology	07
Q.6 Write short notes on any Four of the following:	14
1) Transmission Electron Microscope	
2) Cryopreservation of cells	
3) Autoradiography	
4) MALDI	
5) Ultracentrifugation	
6) NMR	

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SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN - 717	Monday 21/11/2016	10.30 AM to 01.00 PM	Cell And Molecular Biology	HCT 1.3	

- Instructions:** 1) Q.1, 2 & 6 are compulsory.
2) Answer any two questions from Q.3, 4 & 5

Total Marks : 70

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

- 1) Integral protein of plasma membrane are synthesize on _____
a) Free Ribosomes b) Rough ER
c) Golgi apparatus d) Lysosomes
- 2) A tubulin protein is a _____
a) Monomer b) Heterodiomer
c) Trimer d) Tetramer
- 3) The kinesin are the motor molecules that are related to the _____
a) Intermediate filaments b) Microfilaments
c) Microtubules d) Myosin filaments
- 4) Typically the wall of the microtubule is composed of _____ protofilaments.
a) 10 b) 11
c) 12 d) 13
- 5) The core of the microfilaments is formed of _____
a) Microtubules b) Intermediate filaments
c) Actin filaments d) Collagen fibres
- 6) The plasma membrane of the plant cell have _____ types of functional complexes.
a) Plasmodesmata b) Gap junction
c) Desmosomes d) Focal adhesion
- 7) A major fibrous protein of the extracellular matrix is _____
a) Integrins b) Intermediate filaments
c) Collagen d) Elastin

Q.2 State how G-actin are organized into F-actin. 14

Q.3 Answer the following:

- A) Describe the structure and function of Microtubule. 07
- B) Describe the role of Golgi complex in protein trafficking. 07

- Q.4 Explain the following:**
- A) Describe the structure and function of Microtubule. **05**
 - B) How are the lysosomes are involved in protein synthesis and comment upon their functions? **05**
 - C) Describe the structure of nucleus. **04**
- Q.5 Explain in short:**
- A) What is cancer? Describe the properties of cancer cells. **07**
 - B) What is the passive and active transport? Describe facilitated passive transport with suitable example. **07**
- Q.6 Write short notes on any Four of the following: 14**
- 1) Collagen
 - 2) Antiport
 - 3) Endoplasmic reticulum
 - 4) Kinesins
 - 5) Hemidesmata
 - 6) Tight junctions

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SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN - 718	Wednesday 23/11/2016	10.30 AM to 01.00 PM	Population Genetics and Evolution	SCT 1.1	

Instructions: 1) Q.1, 2 & 6 are compulsory.
 2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

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

- 1) _____ is also called Sewall Wright Effect.
 - a) Gene flow
 - b) Variation
 - c) Gene pool
 - d) Genetic drift

- 2) _____ is the basic or lowest in the classification of animals.
 - a) Species
 - b) Subspecies
 - c) Semispecies
 - d) Deme

- 3) Which factors do not affect Hardy-Weinberg Equilibrium _____
 - a) Natural selection
 - b) Migration
 - c) Non-random mating
 - d) Speciation

- 4) The competition between animals and environment factors is called _____
 - a) Environmental struggle
 - b) Intraspecific struggle
 - c) Interspecific struggle
 - d) Ecological struggle

- 5) Lamarckism theory is also called _____
 - a) Inheritance of acquired characters
 - b) Inheritance of carrier
 - c) Inheritance of required characters
 - d) Inheritance of barrier

- 6) _____ are those base pair replacements where a purine is replaced by another purine and when a pyrimidine is replaced by another pyrimidine.
 - a) Transitions
 - b) Transversions
 - c) Translations
 - d) Transcription

- 7) Sum total of genes present in a Mendelian population is called _____
 - a) Gene flow
 - b) Gene pool
 - c) Gene frequency
 - d) Genetic drift

Q.2 Describe Darwin's theory of evolution with suitable example. 14

Q.3 Answer the following:

- A) Give an account on phylogenetic and biological concept of speciation. 07
- B) Explain the principles of Lamarckism. 07

Q.4 Explain the following:	
A) Ecological significance of molecular variations.	05
B) Variation adaptation	05
C) Parapatric speciation	04
Q.5 Explain in short:	
A) What are transitions and transversion?	07
B) Describe effects of radiations on nucleotide sequence.	07
Q.6 Write short notes on any Four of the following:	14
1) Genetic species concept	
2) Xeroderma pigmentosum	
3) Effect of migration on population	
4) Neo-Darwinism	
5) Gene evolution	
6) Lamarckism use and disuse theory	

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SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN - 719	Wednesday 23/11/2016	10.30 AM to 01.00 PM	Protozoology	SCT 1.2	

Instructions:

- 1) Q.1, 2 & 6 are compulsory.
- 2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

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

- 1) The primary grouping of protozoa is based upon their _____
 - a) feeding habits
 - b) mode of reproduction
 - c) mode of locomotion
 - d) mode of nutrition

- 2) African sleeping sickness is caused by _____
 - a) *Giardia intestinalis*
 - b) *Leishmania donovani*
 - c) *Trypanosoma gambiense*
 - d) *Entamoeba histolytica*

- 3) In Paramoecium, the trichocysts are used for _____
 - a) Offense
 - b) defense
 - c) flight or flight response
 - d) none of above

- 4) Sleeping sickness in man is caused by trypanosome by the bite of the infective -
 - a) male tse-tse fly
 - b) female tse-tse fly
 - c) both male & female tse-tse fly
 - d) none of above

- 5) Which of the following acts as a main reservoir of *Balantidium coli* infection in human beings?
 - a) Man
 - b) Monkey
 - c) Cow
 - d) Pig

- 6) Single celled eukaryotes are include in _____
 - a) fungi
 - b) archae
 - c) Monera
 - d) Protista

- 7) Protozoa were first discovered by _____
 - a) Pasteur
 - b) Leeuwenhoek
 - c) Darwin
 - d) Kudo

Q.2 Give an account on factors influencing the distribution of protozoa mainly Oxygen, Carbon dioxide, pH and Light. 14

Q.3 Answer the following:

- A) Give an account on Nutritional requirements in protozoa. 07
- B) General organization and morphology of the parasitic flagellates occurring in digestive tract of man. 07

- Q.4 Explain the following:**
- A) General morphology of *Chilomastix mesnili* **05**
 - B) Ecology of free living Protozoa **05**
 - C) Coccidia of poultry with special reference treatment and control **04**
- Q.5 Explain in short:**
- A) Describe the Life cycle of *Entamoeba histolytica*. **07**
 - B) Structure and life cycle pattern of acephaline and cephaline Gregarines. **07**
- Q.6 Write short notes on any Four of the following: 14**
- 1) Morphology of *Trichomonas tenax*
 - 2) Parasitism in ciliophora
 - 3) Transmission and pathology of parasitic Amoebae of man
 - 4) Filter feeding in protozoa
 - 5) Classification of Protozoa
 - 6) Morphology of *Giardia lamblia*

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SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN – 720	Wednesday 16/11/2016	10.30 AM to 01.00 PM	Biosystematics	I	

Instructions: 1) Q.1, and 2 are compulsory.
 2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

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

- 1) _____ has an important advantage in all types of phylogenetic research due to high level of variability and a high rate of mutation. The study and reconstruction of evolutionary relationships is
 - a) Phylogeny
 - b) Systematics
 - c) taxonomy
 - d) taxidermy

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

- 3) The determination of the evolutionary history and relationship among organisms is termed as _____.
 - a) Phylogeny
 - b) Phenetic
 - c) Cladistic
 - d) Synthetic

- 4) The method of linear invariants are procedures for inferring the evolutionary relationships among species is described by _____.
 - a) Barry
 - b) Hartigan
 - c) Felsenstein
 - d) Cavender

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

- 6) The ICZN stands for _____.
 - a) International code of Botanical Nomenclature
 - b) International code of Zoological Nomenclature
 - c) International code of viral Nomenclature
 - d) International code of zoo Nomenclature

- 7) 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

Q.2 Describe the different kind's taxonomic keys, illustrate their merits and demerits. 14

Q.3 Answer the following: 07

- A) Molecular perspectives in the conservation of diversity. 07
- B) Historical resume of systematic 07

Q.4 Explain the following:	
A) Importance of Biosystematics in Biology	05
B) Speciation in panmictic and apomictic species	05
C) Hierarchy of categories	04
Q.5 Explain in short:	
A) Molecular Taxonomy	07
B) Describe different kinds of Systematic publications.	07
Q.6 Write short notes on any Four of the following:	14
1) Nucleic acid phylogeny	
2) International code of Zoological nomenclature	
3) Chemotaxonomy	
4) Levels of structural organization of tissue	
5) Construct phylogenetic trees	
6) Amino acid sequences	

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SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN 721	Friday 18/11/2016	10:30 AM to 01:00 PM	Tools And Techniques In Biology	II	

Instructions: 1) Q.1, 2 & 6 are compulsory.
2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

Q.1 Multiple choice questions (per question 2 marks)

14

- 1) The resolution power of electron microscope is _____
 - a) 0.3-0.5 nm
 - b) 5-10 nm
 - c) 1-3 nm
 - d) 20-25 nm
- 2) The first human hormone produced by gene cloning was _____
 - a) thyroxine
 - b) Insulin
 - c) Adrenalin
 - d) Estrogen
- 3) Restriction enzymes are synthesized by _____
 - a) yeast cells only
 - b) eukaryotic cells
 - c) bacteria only
 - d) both b and c only
- 4) A piece of DNA that form hybrid and is used to identify a gene is called _____
 - a) vector
 - b) bacteriophage
 - c) probe
 - d) retrovirus
- 5) A method of separation of molecules on the bases of size, and their migration through an electric field is called _____
 - a) chromatography
 - b) sedimentation
 - c) flow cytometry
 - d) electrophoresis
- 6) Units of radioactivity are _____
 - a) Curie
 - b) Hertz
 - c) Ohms
 - d) Celsius
- 7) The technique that uses antibodies to localize particular antigen in cytological preparation is called _____
 - a) immunodiffusion
 - b) immunity chromatography
 - c) immunoelectrophoresis
 - d) immunocytochemistry

Q.2 Give and account on Ultracentrifugation and sub-cellular fractionation.

14

Q.3 Answer the following:	
A) Design and functioning of Tissue Culture Laboratory.	07
B) Application of Electrophoresis and its types.	07
Q.4 Explain the following:	
A) Types of culture and its uses	05
B) Column chromatography	05
C) Cryopreservation of Cells	04
Q.5 Explain in short:	
A) Immunocytochemistry and its applications	07
B) Capillary Culture Units	07
Q.6 Write short notes on any Four of the following:	14
1) Hybrid antibody	
2) Radiolabel Techniques in Biology	
3) Feeder Layers	
4) Autoradiography	
5) Mass Spectroscopy	
6) Vectors	

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SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN – 722	Monday 21/11/2016	10.30 AM to 01.00 PM	Cell and Molecular Biology	III	

Instructions: 1) Q.1, 2 & 6 are compulsory.
 2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

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

- 1) The Principal Structural element of the mitotic spindle are _____
 a) Intermediate filament b) Microfilament
 c) Microtubules d) Myosin

- 2) The wall of a microtubule is composed of _____ protofilaments.
 a) twelve b) thirteen
 c) fourteen d) fifteen

- 3) Which of the following cell components is not part of cytoskeleton of eukaryotic cell _____
 a) Microfilament b) Mitochondria
 c) IF d) Microtubules

- 4) The tubulin dimmers in a protofilament are arranged in the sequence of _____
 a) alfa beta → alfa beta → alfa beta b) alfa alfa → beta beta → alfa alfa
 c) beta beta → alfa alfa → beta beta d) beta alfa → beta alfa → beta alfa

- 5) Microfilaments are composed of _____
 a) Actin b) Actin & Myosin
 c) Myosin d) Cellulose

- 6) Microtubules are involved directly in all the following presence except _____
 a) motion of whole cells via flagella
 b) movement of mitotic spindle
 c) transport of small vesicle within the cytoplasm
 d) Amoeboid motion

- 7) 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

Q.2	Give an account Cytoskeleton. Add a note on Structure and Dynamics of Cilia.	14
Q.3	Answer the following:	
	A) Properties of Cancer cell	07
	B) Actin-binding proteins	07
Q.4	Explain the following:	
	A) Collagens	05
	B) Biomembranes	05
	C) Transport across epithelia	04
Q.5	Explain in short:	
	A) Cell matrix and cell matrix adhesion	07
	B) Protein synthesis on free and bound polysomes	07
Q.6	Write short notes on any Four of the following:	14
	1) Cell junctions	
	2) Biogenesis of mitochondria	
	3) Intermediate filaments: Structure and functions	
	4) Centriole	
	5) Flagella	
	6) Actin-binding proteins	

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SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN - 723	Wednesday 23/11/2016	10.30 AM to 01.00 PM	Population Genetics and Evolution	IV	

- Instructions:**
- 1) Q.1, 2 & 6 are compulsory.
 - 2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

Q.1 Multiple choice questions (per question 2 marks)

14

- 1) The effect of natural selection may be countered by _____
 - a) gene flow
 - b) genetic drift
 - c) mutation
 - d) inbreeding

- 2) Mating with relatives is called _____
 - a) inbreeding
 - b) outcrossing
 - c) random mating
 - d) clines

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

- 4) Slight genetic change over a few generations in a population that does not result in the evolution of a new species is:
 - a) microevolution
 - b) macroevolution
 - c) evolutionary equilibrium
 - d) genetic drift

- 5) Anagenesis is _____
 - a) the evolution of new species within a single evolutionary line without branching
 - b) developing a special adaptation for survival
 - c) Species distribution
 - d) questioning or testing of hypotheses

- 6) A small, isolated population is more likely to undergo speciation than a large population because of a small population _____
 - a) is more effected 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

- 7) “The sum total of the genetically inherited changes in the individuals who are members of a population” is a description of _____
 - a) Non-random mating
 - b) genetic drift
 - c) evolution
 - d) natural selection

Q.2	Derive Hardy – Weinberg equation and add a note on its applications?	14
Q.3	Answer the following:	
	A) Describe in detail Natural Selection and its parameters.	07
	B) Give an account on Macroevolution.	07
Q.4	Explain the following:	
	A) Migration	05
	B) Mutation	05
	C) Polyploidy	04
Q.5	Explain in short:	
	A) Use of genomic studies in biodiversity	07
	B) Allopatric speciation	07
Q.6	Write short notes on any Four of the following:	14
	1) Reproductive isolation	
	2) Microevolution	
	3) Sympatric speciation	
	4) Selection coefficient	
	5) Neo-Darwinism	
	6) Genetic Drift	

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Semester – II (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN – 724	Thursday 17/11/2016	10.30 AM to 01.00 PM	Computational Biology	V	

Instructions: 1) Q.1, 2 & 6 are compulsory.
 2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

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

- 1) 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

- 2) The equation used for prediction or estimation is _____
 a) Corellation b) Histogram
 c) Mean deviation d) Regression

- 3) Highly +ve correlation can be determined if value of r is _____
 a) 0.98 b) 0.68
 c) 0.42 d) 0.52

- 4) Highly –ve correlation can be determined if value of r is _____
 a) -0.64 b) -0.42
 c) -0.52 d) -0.99

- 5) Head note is a part of _____
 a) Classification b) Tabulation
 c) Frequency distribution d) Correlation

- 6) If two coins are tossed simultaneously then probability of getting two heads is_
 a) 1/2 b) 1/3
 c) 1/4 d) 1

- 7) The table giving the frequencies for different class interval is known as _____
 a) Mean b) frequency table
 c) Median d) bivariate table

Q.2 What is histogram? Write a note on histogram with construction of Histogram. 14

- Q.3 Answer the following:**
- A) Requisites of good average 07
 B) Define coefficient of variation 07

Q.4 Explain the following:	
A) Chi Square test	05
B) Measures of central tendency	05
C) Describe range and its coefficient	04
Q.5 Explain in short:	
A) Rank Correlation	07
B) Probability	07
Q.6 Write short notes on any Four of the following:	14
1) Students t-test	
2) Graphical representation with pie chart	
3) Frequency distribution	
4) Binomial distribution	
5) Sequencing analytical techniques for DNA	
6) Normal Distribution	

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SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN - 725	Saturday 19/11/2016	10.30 AM To 02.00 PM	General & Comparative Endocrinology	VI	

Instructions: 1) Q.1, 2 & 6 are compulsory.
2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

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

- 1) Oxytocin and ADH hormones are basically secreted by neurosecretory cell of _____.
a) Stomach
b) Intestine
c) Hypothalamus
d) Kidney
- 2) Hypothalamus secretes (GnRH) which act on gonads to release _____.
a) TH
b) PTH
c) ACTH
d) FSH and LH
- 3) At the end of pregnancy mammary of female secretes a fluid called _____.
a) Saliva
b) Blood
c) HCL
d) Colostrum
- 4) Melanotropin is secreted by _____.
a) Pars intermedia
b) Pars nervosa
c) Pars distalis
d) Infundibulum
- 5) Hepatic phosphorylase the enzyme is responsible for activating _____.
a) Glycolysis
b) metamorphosis
c) Glycogenolysis
d) molting
- 6) Menopause is found in human females of _____ years old.
a) 40-50
b) 30-40
c) 20-30
d) 12-23
- 7) _____ is glycoprotein hormone.
a) MSH
b) FSH
c) ACTH
d) Insulin

Q.2 Long answer type question (compulsory): 14

Describe different types of hormones and their chemical nature.

Q.3 Answer the following: 07

- A) Functions of cerebral hormones in insects. 07
- B) Role of MSH in chordates. 07

Q.4 Explain the following:	
A) Homeostasis (Calcium)	05
B) Role of androgen	05
C) Gastro – intestinal hormones	04
Q.5 Explain in short:	
A) Role of hormones in behavior	07
B) Hormones of pancreas	07
Q.6 Write short notes on any Four of the following:	14
1) Steroid hormone	
2) Leydig cell	
3) Role of LH	
4) Role of relaxin hormone	
5) Role of hormones in regulation of metabolism	
6) Role of progesterone	

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SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN - 726	Tuesday 22/11/2016	10.30 AM To 01.00 PM	Developmental Biology	VII	

Instructions: 1) Q.1, 2 & 6 are compulsory.
2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

Q.1 Multiple choice questions (per question 2 marks)

14

- 1) Rotational cleavage is seen in _____
 - a) amphioxus
 - b) Tunicates
 - c) Echinoderms
 - d) mammals

- 2) Bottle cells are formed during the gastrulation of
 - a) amphibians
 - b) birds
 - c) Echinoderms
 - d) mammals

- 3) 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

- 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 & c

- 6) The study of degenerative changes in aging is called _____
 - a) Developmental biology
 - b) Paedology
 - c) Gerontology
 - d) Chronology

- 7) Primitive streak is formed during the development of _____
 - a) Reptiles
 - b) birds
 - c) mammals
 - d) All of the above

Q.2	Describe in detail the process of gastrulation in chick.	14
Q.3	Answer the following:	
	A) Acrosome reaction	07
	B) Structure of insect egg	07
Q.4	Explain the following:	
	A) Cloning with an example	05
	B) Blastulation in frog	05
	C) Regulation of limb development	04
Q.5	Explain in short:	
	A) How anterior-posterior axis is specified in Drosophila?	07
	B) Apoptosis with reference to the type studied.	07
Q.6	Write short notes on any Four of the following:	14
	1) Embryonic Stem cells	
	2) Oogenesis	
	3) Cleavages in Chick	
	4) Cortical reaction	
	5) Capacitation	
	6) Cloning	

Master of Science – I (Zoology) Examination: Oct / Nov 2016
Semester – II (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN - 727	Thursday 24/11/2016	10.30 AM to 01.00 PM	Environmental Physiology	VIII	

- Instructions:**
- 1) Q.1, 2 & 6 are compulsory.
 - 2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

Q.1 Multiple choice questions (per question 2 marks)

14

- 1) The stage in which the biological processes is used to purify water in a waste water treatment plants is called _____
 - a) Secondary sewage treatment
 - b) Primary sewage treatment
 - c) Wastewater reduction
 - d) Biochemical reduction

- 2) How the biological oxygen demand gets affected with the increased presence of organic matter in water?
 - a) The oxygen demand increases
 - b) The oxygen demand decreases
 - c) The oxygen demand remains unchanged
 - d) None of the above

- 3) The depletion in the Ozone layer is caused by
 - a) nitrous oxide
 - b) carbon dioxide
 - c) chlorofluorocarbons
 - d) methane

- 4) Which of the following is not as a consequence of global warming?
 - a) rising sea level
 - b) increased agricultural productivity worldwide
 - c) worsening health effects
 - d) increased storm frequency and intensity

- 5) The prime health risks associated with greater UV radiation through the atmosphere due to depletion of stratospheric Ozone?
 - a) Damage to digestive system
 - b) Increased liver cancer
 - c) Neurological disorder
 - d) Increased skin cancer

- 6) An indigestible carbohydrate such as cellulose that stimulates peristalsis in the intestine.
 - a) Protein
 - b) Fiber
 - c) Vitamins
 - d) Fats

- 7) What does the liver do when blood glucose levels are particularly high?
 - a) release a large quantity of bile to break up glucose molecules
 - b) removing glucose from the bloodstream to prevent damage to the immune system, kidneys, eyes and heart
 - c) begin to store glucose in small sacks located inside the pancreas and gall bladder
 - d) All the above

Q.2	Write an account on structure of heart.	14
Q.3	Answer the following:	
	A) Causes of stress	07
	B) BMR	07
Q.4	Explain the following:	
	A) Waste elimination in respiration	05
	B) Physiological response to stress	05
	C) Environmental stress due to toxins	04
Q.5	Explain in short:	
	A) ECG	07
	B) Exchange of gases in respiration	07
Q.6	Write short notes on any Four of the following:	14
	1) Effects of occupational stress	
	2) Levels of adaptation	
	3) Industrial health hazards	
	4) Digestion in mammals	
	5) Space physiology	
	6) Organ system adaptation	

Master of Science – II (Zoology) Examination: Oct / Nov 2016
Semester – III (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN-736	Wednesday 16/11/2016	02.30 PM To 05.00 PM	Molecular Cytogenetic	IX	

- Instructions:** 1) Q.1, 2 & 6 are compulsory.
 2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

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

- 1) In Prokaryotes 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) Tip of the chromosomes are called _____
 a) Euchromatin b) heterochromatin
 c) allochromosome d) telomere
- 4) The nucleotide sequences in eukaryotic DNA that encode a polypeptide 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 complement 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 of genetic material.
 a) Transformation b) Conjugation
 c) Transduction d) Translocation
- 9) The sex in Drosophila is determined by _____
 a) X and Y chromosomes b) X/A ratio
 c) Z and W chromosomes d) haploidy

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 chromosomal theory of sex determination in humans? 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) DNA Sequencing by Sanger	07
Q.6 Write short notes on any Four of the following:	14
1) Plasmid	
2) Imprinting	
3) C-value paradox	
4) Pedigree analysis	
5) Mitochondrial genome	
6) Sickle cell anaemia	

Master of Science – II (Zoology) Examination: Oct / Nov 2016
Semester – III (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN - 737	Friday 18/11/2016	2:30 PM to 5.00 PM	Biochemistry	X	

Instructions: 1) Q.1, 2 & 6 are compulsory.
2) Answer any two questions from Q.3, 4 & 5

Total marks:70

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

- 1) The sugar present in milk is _____
 - a) maltose
 - b) lactose
 - c) arabinose
 - d) galactose
- 2) The entropy of universe always increases is the _____ law of thermodynamics.
 - a) zeroth
 - b) first
 - c) second
 - d) third
- 3) The glycogen is stored _____ and _____ in human.
 - a) brain, lung
 - b) skeletal muscle, liver
 - c) kidney, liver
 - d) heart, brain
- 4) _____ is regulatory enzyme in cholesterol biosynthesis.
 - a) HMG CoA reductase
 - b) Mevalonate oxidase
 - c) Acyl transferase
 - d) Squalane epoxidase
- 5) Glycogen phosphorylase enzyme is regulated by _____.
 - a) Feedback regulation
 - b) zymozyme activation
 - c) covalent modification
 - d) Compartmentation
- 6) The enzyme catalyzing breakdown reaction in presence of water belongs to _____ class in IUB classification.
 - a) Second
 - b) Third
 - c) Fourth
 - d) Sixth
- 7) Lipids are stored in the body mainly in the form of _____.
 - a) phospholipids
 - b) glycolipids
 - c) fatty acids
 - d) triacylglycerides

Q.2 Long Answer Type question: 14
Explain in detail oxidative phosphorylation.

Q.3 Answer the following: 07
A) Give an account on A-form, B-form and Z-form DNA. **07**
B) Write a note on general reactions of amino acid metabolism. **07**

Q.4 Explain the following:	
A) Metabolic regulation during hypoxia	05
B) Isoenzymes	05
C) Energy rich bonds	04
Q.5 Explain in short:	
A) Secondary structure of proteins	07
B) Biosynthesis of fatty acids	07
Q.6 Write short notes on any Four of the following:	14
1) Apozymes	
2) Phospholipid biosynthesis	
3) Sources of atoms in purine	
4) Structure of cAMP and its role	
5) Fatty acids	
6) Inhibitors of enzyme	

Master of Science – II (Zoology) Examination: Oct/Nov 2016
Semester – III (New-CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN– 738	Monday 21/11/2016	2:30 P.M to 5:00 P.M	Comparative Animal Physiology	XI	

- Instructions:**
- 1) Questions 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 book.
 - 4) Figures to the right indicate marks.

Total Marks: 70

Q.1 Choose the correct alternative given in the bracket. 07

- 1) Ureotelic animals excrete nitrogenous waste in the form of -----.
 - a) Urea
 - b) Uric acid
 - c) Guinea
 - 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 occurs 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 Give an account of respiratory pigments with their regulation in different animals. 14

Q.3	a) Role of Chromatophores.	07
	b) Write a note on poikilotherns.	07
Q.4	a) Write a note on Hibernation	05
	b) Give an account on Bioluminescence	05
	c) Functions of blood	04
Q.5	a) Explain the digestive system in human.	07
	b) Give an account of neurotransmitters.	07
Q.6	Write short notes (any 4):	14
	1) Neural regulation of homeostasis	
	2) Types of receptors	
	3) Basal metabolic rate (BMR)	
	4) Role of isoenzymes (LDH)	
	5) S. A. node	
	6) Describe glomerulus filtration(GFR)	

Master of Science – II (Zoology) Examination: Oct / Nov 2016
Semester – III (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN – 739	Wednesday 23/11/2016	02:30 P.M To 05:00 P.M	Wild life and Conservation Biology	XII	

Instructions: 1) Q.1, 2 & 6 are compulsory.
 2) Answer any two questions from Q.3, 4 & 5

Total Marks: 70

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

- 1) Cryopreservation involves storages of cells from embryos and shoots tips in liquid nitrogen at _____

a) 0°C	b) 5°C
c) -196°C	d) 100°C

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

a) correlation	b) population
c) sampling	d) diversity index

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

a) National Wildlife Action Plan	b) WWF
c) Red Data Book	d) Indian Data Book

- 4) The intermediate transitional zone between two ecological communities is known as _____.

a) Ecology	b) Exobiology
c) Ecotone	d) Ecosphere

- 5) A local association of several populations of different species is known as _____.

a) Society	b) Community
c) Ecotomus	d) Biomass

- 6) Earth Summit at Rio-de-Janeiro was related to _____.

a) Soil fertility	b) Survey of natural resources
c) Conservation of environment	d) Preservation of wild animals

- 7) The interconnected network of feeding relationship within an ecosystem is known as _____.

a) Food chain	b) Food web
c) Food mass	d) Food box

Q.2 Give and account on the Tsunami and its effect on ecosystem and community structure. 14

Q.3 Answer the following:	
A) Describe in detail Agricultural practices	07
B) Give an account on Industrialization	07
Q.4 Explain the following:	
A) Environmental Impact Assessment (EIA)	05
B) Ecotone	05
C) Deforestation	04
Q.5 Explain in short:	
A) Ecological succession- Aquatic	07
B) Biodiversity hotspots	07
Q.6 Write short notes on any Four of the following:	14
1) Classification of communities	
2) Food Chain	
3) Niche	
4) National Parks in India	
5) Abiotic factors	
6) Landslides – Its effect on ecosystem	

Master of Science – II (Zoology) Examination: Oct / Nov 2016
Semester – III (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN-740	Wednesday 23/11/2016	02:30 PM to 05:00 PM	Research Methodology & IPR in Zoology	XII	

Instructions:

- 1) Q.No.1 and 2 are compulsory.
- 2) Attempt any two questions from Q. No. 3, 4 and 7.

Total Marks: 70

Q.1 MCQ (Per questions 2 marks)

14

- 1) Four important technique used to explore the information need of users are
 - a) Questionnaire, investigation, dairy, observation
 - b) Questionnaire, interview, dairy, observation
 - c) Questionnaire, investigation, report, observation
 - d) None of the above
- 2) The main purpose of research in education is to _____
 - a) Help in the personal growth of an individual
 - b) Help the candidate become an eminent educationist
 - c) Increase job prospects of an individual
 - d) Increase social status of an individual
- 3) Sampling is advantageous as it _____
 - a) Help in capital – savings
 - b) Save time
 - c) Increase accuracy
 - d) Both a and b
- 4) Random sampling is helpful as it is _____
 - a) A economical method of an data collection
 - b) Free from personal biases
 - c) Reasonably accurate
 - d) All the above
- 5) Which of the following is not a problem associated with using web sites sources of data?
 - a) The sample of web sites is only as good as the keywords used to search for them.
 - b) It is difficult to find any web sites about most topics in social search
 - c) New web sites are constantly appearing while others are disappearing
 - d) The content of web sites is likely to change as they are updated
- 6) Which of the following is not a feature of a literature review?
 - a) Develop valid arguments supported by up-to-date and credible sources.
 - b) Identify the prevailing theories and hypothesis
 - c) Identify areas of controversy in the literature
 - d) Consider the problem broadly as it refers to the thesis problem or research question

- 7) Information is _____
- a) Raw data
 - b) Raw knowledge
 - c) Input data
 - d) Organized data

Q.2	Describe in detail the methods of data collection for research work	14
Q.3	Answer the following	
a)	Give and account on thesis writing	07
b)	Paper presentation in conferences.	07
Q.4	Explain the following.	
a)	Give an account on patent writing.	05
b)	Impact factors ant its importance.	05
c)	Peer reviewed journal	04
Q.5	Explain in short :	
a)	Types of search engines, with their application	07
b)	Give an account on hypothesis testing	07
Q.6	Write short notes (any four)	14
a)	Science citation index	
b)	Note on collection of Literature	
c)	Google scholar	
d)	Use of Microsoft excel in research work	
e)	Copyright	
f)	ISSN	

Master of Science – II (Zoology) Examination: Oct. / Nov. 2016
Semester – IV (CGPA)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SN – 744	Thursday 24/11/2016	02:30 PM To 05:00 PM	Zoo Keeping and Animal House Management	XVI	

- Instructions:**
- 1) Q.1, 2 & 6 are compulsory.
 - 2) Answer any two questions from Q.3, 4 & 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.

Total Marks: 70

SECTION I

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

- 1) Cryopreservation involves storages of gametes in liquid nitrogen at _____.
 - a) 0°C
 - b) 5°C
 - c) -196°C
 - d) 100°C

- 2) 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

- 3) Spoiling of zoo by physical and chemical factors is termed _____.
 - a) contamination
 - b) adulteration
 - c) poisoning
 - d) pollution

- 4) 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

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

- 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) In India crocodile breeding centre is located in _____.
 - a) Kolkata
 - b) Chennai
 - c) Chilica lake
 - d) Tiruvananthapuram

SECTION II

- Q.2** Give and account of Taxidermy. How taxidermist prepares head, skin and fish mounts? **14**
- Q.3 Explain in Short:**
- A)** Contraception in zoo mammals **07**
 - B)** Managing water birds **07**
- Q.4 Explain in Short:**
- A)** Veterinary care of a zoo **05**
 - B)** Bird feeds **05**
 - C)** Laboratory Rat **04**
- Q.5**
- A)** Discuss housing practices is common zoo reptiles. What special precautions are to be taken in keeping snakes in zoo? **07**
 - B)** How to prevent infection of avian infections. **07**

SECTION III

- Q.6 Write short notes on any Four of the following:** **14**
- 1) Public awareness programmes in a zoo
 - 2) Visitor rules regulations and surveillance in a zoo
 - 3) Elephant and camel management
 - 4) Crocodile Conservation
 - 5) Great Indian Bustard
 - 6) Sanctuary