



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Subject: Zoology

Paper: I (Environmental Biology)

Roll No.

Time: 3 Hrs. Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

1.	i. Discuss Conservation of MINERAL RESOURCES as a NON-RENEWABLE RESOURCE. ii. "All KEYSTONE SPECIES are predators?" Discuss the statement.	8 7
2.	i. What is ECOSPHERE? What is the impact of industrialization on ecosphere? ii. Define EXPONENTIAL POPULATION GROWTH. Discuss conditions required for EXPONENTIAL GROWTH.	8 7
3.	i. How does ENVIRONMENT LIMIT population growth? ii. Explain NUTRIENT CYCLE giving a suitable diagramme.	9 6
4.	i. Briefly narrate different types of FRESHWATER ECOSYSTEMS. ii. Define BIOGEOCHEMICAL CYCLE? Explain cyclic flow how of CARBON between four basic spheres.	8 7
5.	i. Define BIOLOGICAL SUCCESSION. "Population changes over the time during succession is natural process." Explain the statement. ii. Can you justify the relationship between AIR POLLUTION AND GLOBAL WARMING?	9 6
6.	i. Briefly discuss different basic forms of INTERACTIONS between different POPULATIONS. ii. Write a detailed note on CHEMICAL WARFARE.	7 8
7.	i. Briefly describe different factors effecting AQUATIC PRIMARY PRODUCTIVITY. ii. Discuss natality and mortality as POPULATION CHARACTERS.	6 9
8.	Define a RANGELAND? How is RANGELAND managed for a sustained productivity?	15
9.	i. Write a brief note on sources, impacts and control of water pollution. ii. Briefly discuss GREENHOUSE GASES,	10 5



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: II (Evolution and Principles of Systematic Zoology)

Time: 3 Hrs.

Marks: 75

NOTE: Attempt any FIVE questions in all by selecting THREE questions from Part-A and TWO questions from Part-B. All questions carry equal marks.

PART A		
Q1. (a)	In the presence of natural selection how polymorphism is maintained in a population?	8
(b)	Discuss shifting balance theory of evolution.	7
Q2	Describe the role of mutation and migration in microevolution.	15
Q3	What is linkage disequilibrium? Describe factors that cause increase or decrease in the frequency of associated genes.	15
Q4 (a)	“Gene is a unit of selection”. Discuss	8
(b)	What is coevolution and how it operates in the population?	7

P.T.O.

Q5.	Write a detailed note on origin of life.	15
PART B		
Q6. (a)	Describe Type method of naming taxa.	8
(b)	Discuss Evolutionary species concept.	7
Q7. (a)	Discuss the concept of polytypic species.	8
(b)	Describe the Types of taxonomic publications.	7
Q8.	Write a note on Cladistic classification	15
Q9.	Write notes on	
(a)	Methods of speciation	7
(b)	Clines and Hybrid zones	8



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Subject: Zoology

Paper: III (Zoogeography & Principles of Palaeontology)

Roll No.

Time: 3 Hrs. Marks: 75

**NOTE: Attempt any FIVE questions. Select at least TWO questions from each part.
All questions carry equal marks.**

Part- I (Paleontology)

- Q 1: Write note on; (a) Igneous Rocks (b) Metamorphic Rocks (8+7) 15
- Q 2: Explain the following; (a) Carbon Dating (b) Paleomagnetism (c) Middle Siwaliks (5+5+5) 15
- Q 3: Write Note on; (a) Upper Siwaliks (b) Index Fossils (c) Petrification (5+5+5) 15
- Q 4: Write and sketch the evolutionary history of Man 15
- Q 5: Write short notes on the; (a) *Protylopus* (b) *Hipparion* (c) *Elephas* 15

P.T.O.

Part- II (Zoogeography)

- Q 6: Differentiate the fauna of Oceanic Islands from Continental Islands. Also highlight the modifications within the fauna of these Islands with some suitable examples 15
- Q 7: Give in detail the Physical Features, Climate and Fauna of Neotropical Region 15
- Q 8: Describe the Barriers and Means of Dispersals of Terrestrial Animals 15
- Q 9: Give the Zoogeographical Distribution of the following animals;
- (i) *Bos* (ii) Cuckoo (iii) Armadillo (iv) *Tenrecs* (v) Koala (vi) *Xenopus*
- (vii) Gaviel (viii) *Neoceratodus* (ix) *Camelus* (x) Cassowaries (1.5 each) 15
- Q 10: Define and explain the Continental Drift Theory, also give examples in favor of it 15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: IV-IA (Entomology 'A') [Morphology, Physiology & Ecology]

Time: 3 Hrs. Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q. No. 1	Write down general characteristics of insects.	15
Q. No. 2	Write down the mode of respiration in aquatic and endoparasitic insects.	15
Q. No. 3	Discuss pigmentation and physical colours in insects.	15
Q. No. 4	Give a brief account of different types of legs in insects.	15
Q. No. 5	Give a brief account of exocrine glands in insects.	15
Q. No. 6	Insect respiratory system is classified according to the number and arrangement of functional spiracles. Discuss in brief.	15

P.T.O.

Q. No. 7	Give a brief account of different types of ovarioles in insects.	15
Q. No. 8	Write short notes on: i) Tentorium ii) Castration iii) Malpighian tubules	15 (3x5)
Q. No. 9	Differentiate between the following: i) Opisthognathous and Hypogenathous Heads ii) Nephrocytes and Oenocytes iii) Trachea and Tracheoles iv) Mimicry and Repedlancy v) Predation and Competition	15 (5x3)



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: IV-3A (Physiology -A) {Physiology of Coordination}

Time: 3 Hrs.

Marks: 75

**NOTE: Attempt any FIVE questions. All questions carry equal marks.
Support your account with illustration's where necessary.**

- | | | |
|-------|--|----|
| Q. 1. | Account, comprehensively, the Phosphatidylinositol derived second messenger system. | 15 |
| Q. 2. | Describe, in detail, the G protein cycle and the role of GTP binding proteins in cell signaling. | 15 |
| Q. 3. | Give a detailed account of abnormalities of growth hormone secretion. | 15 |
| Q. 4. | Describe, in detail, the causes and consequences of Type I Diabetes mellitus. | 15 |
| Q. 5. | a) Give a detailed account of sliding filament mechanism of muscle contraction. | 9 |
| | b) Briefly describe the functions (any three) of muscular tissue | 6 |

P.T.O.

Q. 6	<ul style="list-style-type: none"> a) Give a detailed account of generation of action potential in a neuron b) Write a note on electroencephalogram 	<p style="text-align: right;">10</p> <p style="text-align: right;">5</p>
Q.7.	Discuss, in detail, the biological functions of estrogens and their effects on primary and secondary sex characteristics, in females.	15
Q. 8.	Give a detailed account of <ul style="list-style-type: none"> a) Depression and Manic-Depressive b) Schizophrenia 	<p style="text-align: right;">7.5</p> <p style="text-align: right;">7.5</p>
Q. 9.	Describe, in detail, the conduction of a nerve signal in an unmyelinated and a myelinated nerve fiber	15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: IV-5A (Microbiology 'A' General Microbiology)

Time: 3 Hrs.

Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- | | | |
|------|---|--------|
| Q. 1 | Explain various methods of maintenance and preservation of pure cultures of bacteria. | 15 |
| Q. 2 | Enlist various types of microscopes. Discuss fluorescence microscopy in detail. | 15 |
| Q. 3 | Describe various types of bacteriological media and their special uses. | 15 |
| Q. 4 | a) Describe major characteristics of microorganisms
b) Write a note on numerical taxonomy. | 8
7 |
| Q. 5 | a) Discuss characteristics of algae in detail.
b) Discuss importance of Mycorrhizas. | 8
7 |
| Q. 6 | Give a comprehensive note on different methods of classifying bacteria. | 15 |

P.T.O.

- Q. 7. Give an account on various growth phases of a typical bacterium following its batch inoculation. Support your answer with suitable sketches. 15
- Q. 8. Discuss different methods used in microbiology for isolating pure cultures of anaerobic bacteria. 15
- Q. 9. Write note on the followings:
- a- Bacterial endospores 05
 - b- Acidophiles and Halophiles 05
 - c- Synchronous growth 05



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M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: IV-6A (Fisheries 'A') [Principles of Fish Biology]

Time: 3 Hrs.

Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q.No.1: Compare biological and morphological characters of *Ctenopharyngodon idella* and *Wallago attu* two freshwater fishes. (7.5+7.5)

Q.No. 2: Write a detailed note on scales in fishes on the basis of their structure. Draw labeled diagram also. (10+5).

Q.No.3: What is membranous Skelton in fish? Explain it in detailed.(15).

Q.No.4: Describe heart in three major groups of fishes. Draw labeled diagram also. (5+5+5)

Q.No.5: Write notes on Notochord and cranial nerves in fishes (7.5+7.5).

Q. No. 6: Describe structure and function of gills in bony fishes. (7.5+7.5)

Q. No. 7: Explain and Draw structure of pectoral and pelvic fin girdle in fishes (7.5+7.5)

Q.No.8: Write notes on Liver and Kidney in fishes. (5+5+5)

Q. No. 9: Write notes on following:

(a) Ecological classification of fishes (7. 5)

(b) Gonads in Fishes (7.5)



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M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Time: 3 Hrs. Marks: 75

Paper: IV-IB (Entomology 'B') [Classification of Insects and Pest Management]

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- Q1. Give a brief account of morphology and biology of any three orders. [5,5,5]
- Siphunculata
 - Collembola
 - Strepsiptera
 - Odonata
 - Ephemeroptera
- Q2. a). Give diagnostic characters of Hemiptera? [3,12]
b). Write notes on the morphology and bionomics of any three families of Hemiptera?
- Q3. a). Give diagnostic characters of Hymenoptera? [3,12]
b). Make a comparison of social organization of Termites and Ants?
- Q4. a). Give scientific names of the pests of Cotton. [5,10]
b). Describe Life cycle of any one pest of cotton.
- Q5. Describe steps required for establishing biological control Programme. [15]

P.T.O.

Q6. Write notes on any three of the following?

[5,5,5]

- i. Culicidae
- ii. Tabanidae
- iii. Vespidae
- iv. Bombycidae
- v. Coccinellidae

Q7. Give a detailed account on Pyrethroids?

[15]

Q8. What are the attributes of beneficial organisms in biological control?

[15]

Q9. a). What are the diagnostic features of order Orthoptera?

[3,12]

b). Describe "Phase Theory of Locust by Uvarov" in detail?



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M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: IV-3B (Physiology 'B') [Physiological systems and adaptations]

Time: 3 Hrs. Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- Q.1 Explain all processes involved in digestion in oral cavity.
- Q.2 Describe in detail fine structure and function of nasal epithelium with regards to respiration.
- Q.3 Explain in detail processes of pressure filtration and selective reabsorption in nephron.
- Q.4 What is atheroma? How it can cause a heart attack.
- Q.5 What is cystic fibrosis transmembrane conductance regulator (CFTR)? Explain.
- Q.6 Explain basic anatomy and physiology of nephron.
- Q.7 Discuss Renin-Angiotensin-Aldosterone system with respect to blood pressure.
- Q.8 Describe Hepatic form and function comprehensively.
- Q.9 Write note on the following:
- Atheromatous plaque
 - Asthma
 - Insulin



NOTE: Attempt any FIVE questions. All questions carry equal marks.

- | | | |
|-----|---|----|
| Q.1 | Write a note on recommended uses and limitations of different physical method used to control the microorganism. | 15 |
| Q.2 | a) Differentiate between exotoxin and endotoxin | 8 |
| | b) Describe the effect of holding temperature of raw milk on numbers and types of bacteria | 7 |
| Q.3 | a) Explain the source and mode of action of penicillin and tetracyclines. | 8 |
| | b) Describe the events in infection following penetration | 7 |
| Q.4 | How many major groups of chemical antimicrobial agents? Discuss the mode of action of any four agents used to control microbes. | 15 |
| Q.5 | a) Give a comprehensive note on Germ free animals. | 8 |
| | b) List the major conditions influencing the effectiveness of antimicrobial chemical agents | 7 |
| Q.6 | a) Discuss the mechanism of antibody diversity | 10 |
| | b) Describe the role of microorganism in eruption of teeth in detail. | 5 |
| Q.7 | Give a detailed account on different classes of immunoglobulin. | 15 |
| Q.8 | Describe various aspects of microbial involvement in petroleum | 15 |
| Q.9 | Give an account on various methods of food preservation | 15 |



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: IV-6B (Fisheries 'B') [Fish Physiology and Breeding]

Time: 3 Hrs.

Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- | | | |
|----------|--|---|
| Q. 1 (a) | Give detail note on temperature and photoperiod relation with breeding in fishes. | 8 |
| Q. 1 (b) | Discuss the structure of heart in fishes? | 7 |
| Q. 2 (a) | Osmoregulation is controlled by glands in freshwater fishes. Discuss | 8 |
| Q. 2 (b) | Write a note on thyroid gland in fishes in detail. | 7 |
| Q. 3 (a) | Give an account on growth of fishes in relation to consumption of natural and artificial food. | 8 |
| Q. 3 (b) | Describe the hormonal induced breeding in fresh water fishes. | 7 |
| Q. 4 (a) | Discuss fish feed ingredients of plant origin in detail. | 8 |
| Q. 4 (b) | Compare the digestive systems of herbivorous and carnivorous fishes.
Draw suitable sketches to support your answer. | 7 |

P.T.O.

Q. 5 (a)	Describe the gill ventilation in fishes.	8
Q. 5 (b)	Write a comprehensive note on skin of fishes.	7
Q. 6	Discuss various feeding adaption among fishes.	15
Q. 7 (a)	How lungfishes are adapted to aerial environment.	8
Q. 7 (b)	Write a note on courtship behavior.	7
Q. 8 (a)	Explain the oogenesis process in fishes.	8
Q. 8 (b)	Discuss the reasons of fish migrations in detail.	7
Q. 9	Write a short note on the following	
	a) Osmoregulation in elasmobranchs	5
	b) Diadromous fishes	5
	c) Extensive fish culture	5



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M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: V-1 (Integrated Pest Management)

Time: 3 Hrs.

Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- Q1. Give an account on the role of CROP ROTATION, CROP SPACING and TILLAGE in ecological management? [15]
- Q2. What is economic threshold? Describe four different categories of Economic thresholds (ETs)? [15]
- Q3. Describe physical and biological factors mediating the expression of RESISTANCE? [15]
- Q4. Give a detailed account on PYRETHROIDS? [15]
- Q5. Write note on the any three of the following: [5,5,5]
- Insect growth regulators
 - Fumigants
 - NEONICOTINOIDS
 - Chemo-sterilization
- Q6. a). Explain sterile Insect techniques? [5,10]
- b). Describe Good and bad effects of Insecticides?
- Q7. Give benefits and risks of TRANSGENIC CROPS? [15]
- Q8. Discuss the INTRODUCTION, AUGMENTATION and CONSERVATION with reference to biological control? [15]
- Q9. Discuss different kinds of PESTS in detail? [15]



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M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Time: 3 Hrs. Marks: 75

Paper: V-3 (Classification of Insects, Pest of Agriculture and Pest Management)

NOTE: Attempt any FIVE questions selecting THREE questions from Section – I and TWO questions from Section – II.

SECTION-I

- Q1. Write a detail note on insect pests of rice. (15)
- Q2 (a). Discuss order COLEOPTERA in detail. (8)
- (b) Write a note on order ODONATA. (7)
- Q3. Explain diagnostic feature, economic importance and classification of ISOPTERA (15)
- Q4. Give diagnostic feature, economic importance and classification of Lepidoptera (15)
- Q5. Give diagnostic features and economic importance of orders DERMAPTERA (15)
and ORTHOPTERA.

P.T.O.

SECTION-II

- Q6. Discuss major group of insecticides and their mode of actions. (15)
- Q7. Write a detail note on
- (a) Economic injury level (8)
 - (b) Economic threshold (7)
- Q8. Discuss different types of Insect collection methods (15)
- Q9. Write note on (5x3)
- (a) Integrated pest Management
 - (b) Damage boundary and its role in IPM
 - (c) Control of cockroach



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M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: V-7 (Molecular and Clinical Endocrinology)

Time: 3 Hrs.

Marks: 75

**NOTE: Attempt any FIVE questions. All questions carry equal marks.
Support your account with illustrations, where necessary.**

- | | | |
|-------|--|----|
| Q. 1. | Give a detailed account of panhypopituitarism in children and adults. | 15 |
| Q. 2. | Give a comprehensive account differentiating endemic from idiopathic nontoxic colloid goiter. | 15 |
| Q. 3. | Discuss, in detail, how cortisol is important in resisting stress and inflammation. | 15 |
| Q. 4. | Describe, in detail, the causes and consequences of Primary hyperparathyroidism. | 15 |
| Q. 5. | Describe, in detail, the causes and consequences of Type 2 Diabetes mellitus. | 15 |
| Q. 6. | Considering the example of glucose mobilization, elaborate the response induced by cAMP second messenger system. | 15 |
| Q. 7. | Write notes on the following:
a) Treatment of diabetes and its relation to arteriosclerosis | 9 |
| | b) Glucose Tolerance Test | 6 |
| Q. 8. | Describe, in detail, the G Protein cycle and the role of GTP binding proteins in cell signaling. | 15 |
| Q. 9. | Discuss, comprehensively, the role of calcium as an intracellular messenger. | 15 |



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Subject: Zoology

Paper: V-16 (Applied Fisheries)

Roll No.

Time: 3 Hrs. Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- | | | |
|----------|--|---|
| Q. 1 (a) | Give a comprehensive note on role of plankton as natural food for fishes | 8 |
| Q. 1 (b) | Write a note on essential components of trout hatchery. | 7 |
| Q. 2 (a) | Describe the steps involved in induced breeding of carp in detail. | 8 |
| Q. 2 (b) | Discuss the predation process among fishes. | 7 |
| Q. 3 (a) | Write comprehensive note on fish enemies and their control. | 8 |
| Q. 3 (b) | Discuss different types of diseases caused by bacteria in fishes? | 7 |
| Q. 4 (a) | Give a comprehensive note on different types of fish cultivation. | 8 |
| Q. 4 (b) | Discuss how intensive culture is different from extensive culture. | 7 |

P.T.O.

Q. 5 (a)	Describe the fish preservation process.	8
Q. 5 (b)	Explain the technique involved for preparation of artificial feed.	7
Q. 6 (a)	How will you design and construct a model carp fish farm.	8
Q. 6 (b)	Bottom structure has significant role in success of pond. Discuss	7
Q. 7 (a)	Write the effect of various fertilizers on the fish health.	8
Q. 7 (b)	Give an account on fish feed ingredients of animal origin.	7
Q. 8 (a)	Describe the detailed design of carp hatchery..	8
Q. 8 (b)	Differentiate between monoculture and polyculture of fish. Give examples	7
Q 9	Write a short note on the following	5
	a) Aquatic vegetation	5
	b) Natural breeding	5
	c) Prophylaxis	



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: V-18 (Fundamentals of Microbiology)

Time: 3 Hrs.

Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- Q.1 Give a comprehensive note on contributions of Louis Pasteur in the development of science of microbiology. 15
- Q.2 a- Write grouping of bacteria with respect to their optimum temperature. 8
b- Discuss septum formation in Gram positive cocci. 7
- Q.3 a- Write an account on differential staining of bacteria. 7
b- Explain different methods for cultivation of an-aerobic bacteria. 8
- Q.4 Describe methods by which continuous bacterial cultures are established. Also write the importance of continuous culturing of bacteria 15
- Q.5 Describe different nutritional types of bacteria with respect to their carbon and energy sources. 15

P.T.O.

Q. 6	Discuss fine structure and different types of bacterial flagella. Also elaborate the mechanism of bacterial motility.	15
Q. 7	a- How bacteria are classified with reference to their genetic relatedness.	8
	b- Describe different methods of maintenance and preservation of bacterial cultures.	7
Q. 8	a- Discuss distinguishing characteristics and importance of fungi.	7
	b- Explain ecological importance of phytoplanktons	8
Q. 9	Write notes on the followings.	
	a- shape of bacteria	05
	b- Lag and log phase	05
	c- synchronous growth	05



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M.A./M.Sc. Part – II Annual Exam – 2019

Subject: Zoology

Paper: V-20 (Mammalogy)

Roll No.

Time: 3 Hrs. Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

1	Give characters differentiating Prototheria from Metatheria.	15
2	Differentiate between: a-Cetacea and Sirenia b-Chiroptera and Dermoptera c-Pinnipedia and Fissipedia	3x5=15
3	Write a detailed note on: a-Echolocation in bats. b-Gliding of Flying squirrel	2x7.5=15
4	Write order, family and distribution of the following mammals. a-Markhor b-Dugong c-Rhinoceros d-Bat e-Tiger f-Duck-billed platypus	6x2.5=15

P.T.O.

5	Discuss: a-Climbing movement in arboreal mammals. b-Leaping movement in terrestrial mammals c-Swimming movement in aquatic mammals	3x5=15
6	Describe dispersal of the following mammals: a-Whale b-Bat c-Reindeer	3x5=15
7	a-Classify mammals according to their diet. b-Write a note on Armadillo, Aardwark and Pangolin.	2x7.5=15
8	Write a detailed note on the following topics. a-Aestivation b-Hibernation	2x7.5=15
9	Write a detailed note on origin and evolution of mammals.	15



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M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: V-21 (Immunology)

Time: 3 Hrs.

Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q. No.	Question	Marks
1	Explain the structure and function of cells involved in immune response	15
2	Discuss the factors affecting the antigenicity of an antigen in details	15
3	Draw structure of B-cell and explain clonal selection theory for generation of specific antibodies.	15
4	Describe structure of MHC class I, IgG and TCR, what is common in them?	15
5	Write a note on synthesis and clinical uses of monoclonal antibodies	15
6	Describe the structure of MHC I and process of endogenous antigen presentation.	15
7	Define hypersensitivity. Explain mechanism and responses of type IV hypersensitivity	15
8	Write short notes on the following a. Prozone effect b. Western blotting c. Radial Immunodiffusion	15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Subject: Zoology

Paper: V-22 (Vector Biology)

Roll No.

Time: 3 Hrs. Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- Q.1. a, Explain life cycle of Tsetse Fly. 8
B, Describe control measures of Tsetse Fly. 7
- Q.2. a, Describe principal characters that distinguish Anopheline from Culicine Mosquitoes. 12
B, What are phoretic Species 3
- Q.3.a, What is Leishmaniasis? 2
B, Describe main clinical forms of Leishmaniasis. 13
- Q.4. a, Describe life cycle of Tabanid. 7
B, Explain Loiasis 8
- Q.5. Discuss different methods for the control of Mosquitoes. 15
- Q.6. Discuss Life Cycle and Medical Importance of House Fly. 15
- Q.7. What is Myiasis. Explain different types of Myiasis. 15
- Q .8. Write notes on any two of the followings. (2x7.5) = 15
A, Cordylobia anthropophaga B, Dermatobia hominis
C, Wohlfartia



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Subject: Zoology

Paper: V-26 (Human Embryology & Teratology)

Roll No.
Time: 3 Hrs. Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- Q. 1. DESCRIBE **OÖGENESIS** WITH REFERENCE TO THE **FOLLICULAR DEVELOPMENT** IN HUMANS
- Q. 2. ENLIST THE **ENVIRONMENTAL TERATOGENS**, WITH BRIEF ACCOUNT ON THEIR DELETERIOUS EFFECTS.
- Q. 3. GIVE AN ACCOUNT OF NORMAL **HUMAN BRAIN** DEVELOPMENT AND ITS MAJOR ANOMALIES
- Q. 4. EXPLAIN THE NORMAL DEVELOPMENT AND THE DEVELOPMENTAL DEFECTS OF **PLACENTA**
- Q. 5. DESCRIBE THE DEVELOPMENT OF **BONE** AND **CARTILAGE**, ALSO GIVE THEIR DEVELOPMENTAL DEFECTS.
- Q. 6. WRITE A DETAILED ACCOUNT ON **DEVELOPMENT OF TESTIS** AND MALE REPRODUCTIVE DUCT SYSTEM
- Q. 7. DESCRIBE THE **DEVELOPMENT OF HEART**. ENLIST ITS MAJOR ANOMALIES ENCOUNTERED IN NEONATES
- Q. 8. DESCRIBE THE PROCESS OF **CLEAVAGE** AND **GASTRULATION** IN HUMANS.
- Q. 9. WRITE NOTES ON ANY TWO OF THE FOLLOWINGS:
 - I. **VIRUSES AS TERATOGENS**
 - II. **CLEFT PALATE**
 - III. **IMPLANTATION**





UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: V-27 (Cancer Biology)

Time: 3 Hrs.

Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Q. 1	Write a comprehensive note on properties of cancer cells	15
Q. 2	What is End Replication Problem (ERP)? How cancer cells overcome ERP to maintain uncontrolled proliferation?	15
Q. 3	Write a comprehensive note on dietary carcinogens	15
Q. 4	a) What is Leukemia? Describe different types of Leukemia? b) What are retroviruses? Describe their mode of action.	8 7
Q. 5	a) What is STAT3 signaling pathway? Describe its role in tumorigenesis. b) Describe regulation of STAT3 signaling pathway.	7 8
Q. 6	a) Describe structures and functions of G-protein coupled receptors (GPCRs) and G-protein? b) Write a note on G-protein cycle.	7 8

P.T.O.

Q. 7	What are DNA oncoviruses? Describe the mode of infection and mechanism of action of Human Papiloma virus as an example of DNA-oncovirus in induction of human cancers.	15
Q. 8	a) What is extracellular matrix (ECM)? Describe the main components of ECM. b) How ECM is disrupted in cancer cells?	8 7
Q. 9	a) What are local chemical mediators? Describe different types of local chemical mediators with examples. b) How Hepatitis B virus (HBV) is different from other DNA oncoviruses in its mode of action?	8 7



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Roll No.

Subject: Zoology

Paper: V-29 (Molecular Biology)

Time: 3 Hrs.

Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Sr. No. of Question	Questions	No. of Marks
Q.1.	Discuss the process of DNA replication in Eukaryotes.	15
Q.2.	Give the assembly of transcription factors for the initiation of transcription on tRNA and rRNA promoters.	15
Q.3.	a) What are vectors? Describe in detail about Cosmids and Phagemids?	7.5
	b) Describe the process of translation initiation in prokaryotes.	7.5
Q.4.	a) How cDNA libraries are prepared?	6
	b) What is DNA finger printing and DNA typing? Explain their forensic uses.	9

P.T.O.

Q.5.	a) What is nucleosome, Describe its structure.	8
	b) Explain the acetylation of histone and its effect on transcription.	7
Q.6.	Describe the cascade of events for the regulation of <i>lac</i> operon in <i>E. coli</i> .	15
Q.7.	Discuss the posttranslational modifications in eukaryotes.	15
Q.8.	What is blotting, Explain the procedure of Southern blotting for the molecular analysis of DNA	15
Q.9	Write notes on two of the following:	
	(a) Photoreactivation repair.	7.5x2=
	(b) Types of promoter and their structure	15
	(c) Micro RNA and RNAi.	



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Exam – 2019

Subject: Zoology

Paper: V-30 (Virology & Viruses)

Roll No.

Time: 3 Hrs.

Marks: 75

NOTE: Attempt any FOUR questions. All questions carry equal marks.

Serial No. of questions	QUESTIONS	No. of Marks
	Attempt any FOUR questions. All questions carry equal marks.	
1.	Reference to the structure of viruses, give a comprehensive account of different types of viral genomes, genome size, secondary and tertiary structure of genome and modifications at the ends of the genome.	18.75
2.	Discuss in detail vector based and non-vector based viral transmission	18.75
3.	During the course of viral life cycle, viral attachment and entry to the host cell is vital process. Explain how the animal viruses enter the host cell.	18.75
4.	Which virus causes Acquired Immunodeficiency Syndrome (AIDS).	18.75
5.	What is Baltimore classification of viruses. Discuss in detail transcription of various types of genetic material in viruses.	18.75
6.	Which cellular sites are involved in viral genome replication. Discuss in detail how viral genome replicates	18.75
7.	How the assembly of nucleocapsid is executed for exit of the virions from host cell.	18.75