



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Roll No.

Subject: Zoology

Paper: I (Environmental Biology)

Time: 3 Hrs. Marks: 75

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

Q.1.	i. Define BIOGEOCHEMICAL CYCLE. Discuss in detail the flow of CARBON in different spheres.	7
	ii. What is BIOLOGICAL SUCCESSION? Discuss the mechanism involved with changes in POPULATIONS during over time during succession.	8
Q.2.	i. Give a detailed explanation of NUTRIENT CYCLE supported with a neat diagramme.	6
	ii. Discuss, giving examples, the EXPONENTIAL GROWTH in populations.	9
Q.3.	i. Define and explain MINERAL RESOURCES as NON-RENEWABLE RESOURCES. "Mineral resources are backbone of the country and need carefully exploited." Explain the statement.	10
	ii. Briefly discuss POINT and NON-POINT POLLUTANTS.	5
Q.4.	i. Briefly describe ECOLOGICAL EFFICIENCY. Discuss the movement of energy between different trophic levels as explained under SECOND LAW OF THERMODYNAMICS.	9
	ii. "LOCKDOWNS at global level under Covid-19 pandemic appreciably effected the OZONE DEPLETION." Explain.	6
Q.5.	i. Discuss CHEMICAL WARFARE as it stands now.	8
	ii. Can you establish a relationship between POLLUTION and GLOBAL WARMING?	7
Q.6.	Give a detailed account of ENVIRONMENTAL CRISIS.	15
Q.7.	i. Discuss types, process and benefits of DESALINATION.	7
	ii. Briefly describe ZONATION of SEA with ECOLOGICAL STANDPOINT.	8
Q.8.	Define RANGELAND. What are the basic principles of RANGELAND MANAGEMENT for harvesting optimal productivity?	15
Q.9.	i. Discuss sources, impacts and control of WATER POLLUTION.	10
	ii. Give a brief overview of interaction of different SPHERES of the EARTH.	5



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

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.	Describe the Types of Natural Selection with Examples. Also Discuss how average character of population change due to these selections	15
Q2	Discuss the Evolutionary innovations and origin of higher taxa in detail.	15
Q3	What is Polymorphism? How population maintain polymorphism in the presence of Natural Selection.	15
Q4.	Describe the factors that can explain imperfect adaptations in organisms.	15
Q5.	Write note on a) Fisher theory of sexual selection b) Chemical theory of origin of life	8 7
PART B		
Q6	Define Weight of Taxonomic Characters. Also describe in detail which taxonomic characters get High or Low weightage and why?	15
Q7.	Describe Types of Intraspecific variations in a population.	15
Q8.	Write note on a) Evolutionary species concept b) Typological species concept	8 7
Q9.	Discuss types of Taxonomic publications. What are major features of taxonomic articles?	15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Roll No.

Subject: Zoology

Paper: III (Zoogeography & Principles of Palaeontology)

Time: 3 Hrs. Marks: 75

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

Part-1

Palaeontology

- Q 1. Write note on the following: a. Altered Fossils b. Unaltered Fossils (8+7)=15
- Q 2. Write short note on the following: a. CRO MAGNON, b. TRILOBITES,
c. ARCHAEOPTERYX 5+5+5= 15
- Q 3. Write Note: a. Sedimentary rocks, b. Metamorphism (8+7)=15
- Q 4. Write the evolutionary history of MAN 15
- Q 5. Write a note on Geochronology 15

Part-II

Zoogeography

- Q 6. Write Note on, a. Brief History of ZOOGEOGRAPHICAL REGIONS, b. Wallace Line 15
- Q 7. Describe BARRIERS and Means of DISPERSALS for FRESHWATER animals 15
- Q 8. Explain CONTINENTAL DRIFT THEORY 15
- Q 9. Give in detail physical features, climate and fauna of ETHIOPIAN REGION 15
- Q 10. Give the zoogeographical distribution of the following animals
- (i) Black Bear (ii) *Tetracerus* (iii) *Giraffa* (iv) Snowy Owl (v) Cuckoo (vi) *Typhlops*
(vii) Newt (viii) *Lepidosiren* (ix) *Heloderma* (x) Tree frog (1.5each) 15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

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.1	Describe the structure, composition and functions of insect integument along with labeled sketch.	15
Q.2	Write down reasons of success of insects in diverse environment.	15
Q.3	What do you understand by endoskeleton? Discuss in brief.	15
Q.4	Write down different types of mouthparts in insects.	15
Q.5	Compare male and female reproductive organs of insects with a brief account on female reproductive system.	15
Q.6	Write down importance of excretory glands with special reference to Malpighian tubules.	15
Q.7	a) Write down methods of sound production in insects b) How sound is produced by cicada?	(7+8)
Q.8	Discuss the functions of body colours in insects with special reference to pigmentary colours.	15
Q.9	Differentiate between the following i. Opisthognathous and Hypognathous heads ii. Inter-specific and intra-specific competition iii. Paedogenesis and Parthenogenesis iv. Nymph and larva v. Haemocytes and Nephrocytes	(5x3 =15)



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

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. | How many ion channels are involved in generating action potential? Discuss the detailed mechanism of generation of action potential in a neuronal cell. | 15 |
| Q.2. | Discuss, in detail, the cAMP mechanism by which hormones exert their control of cell function. | 15 |
| Q.3. | Give a comprehensive account on "panhypopituitarism" | 15 |
| Q.4. | a) Explain the molecular mechanism of muscular contraction
b) Write down the function (any three) of muscular tissue | 9
6 |
| Q.5. | Briefly described the role of tympanic membrane and the ossicular system in conduction of sound from tympanum to cochlea | 15 |
| Q.6. | Comprehensively, account,
a) The Grand Mal Epilepsy
b) Focal Epilepsy | 9
6 |
| Q.7. | Give a detail account of
a) Schizophrenia
b) Alzheimer's disease | 7.5
7.5 |



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Subject: Zoology

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

Roll No.

Time: 3 Hrs. Marks: 75

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

- | | | |
|------|--|----|
| Q. 1 | Give a comprehensive note on major characteristics of microorganism. | 15 |
| Q. 2 | Discuss various nutritional requirements of bacteria in detail. | 15 |
| Q. 3 | Discuss dark field and fluorescence microscopy in detail. | 15 |
| Q. 4 | Describe contributions of Robert Koch to the development of medical microbiology | 15 |
| Q. 5 | a) Describe the size, shape and arrangement of bacterial cells | 8 |
| | b) Give comprehensive note on septum formation in Gram positive cocci. | 7 |
| Q. 6 | a) Differentiate between cultivation of autotrophic and heterotrophic bacteria. | 8 |
| | b) Explain grouping of bacteria with respect to their optimum pH. | 7 |
| Q. 7 | Explain different methods used in microbiology for isolating pure cultures. | 15 |
| Q. 8 | a) Give an account on synchronous growth in detail. | 8 |
| | b) Give a comprehensive account of Germ theory of disease. | 7 |
| Q. 9 | Write note on the followings: | |
| | a- Psychrophiles and Thermophiles | 05 |
| | b- Endospore | 05 |
| | c- Numerical Taxonomy | 05 |



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Subject: Zoology

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

Roll No.

Time: 3 Hrs. Marks: 75

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

QUESTION NO.1	A) Describe the FRESHWATER ECOSYSTEM with reference to fish distribution. B) Give a brief account for COMPARISON between MARINE and ESTUARINE environment	10+5
QUESTION NO.2	A) Discuss ORGANIC PRODUCTIVITY in aquatic ecosystem. B) Give ECOLOGICAL CLASSIFICATION of fishes	7.5+7.5
QUESTION NO.3	A) Describe the APPENDICULAR SKELTON. Enlist the ADVANTAGES OF SKELETON in fish. B) Describe the ROLE OF SKELETON in ADAPTATIONS on land	10+5
QUESTION NO.4	A) Which types of SCALES are found in fishes? Support your answer with diagrams. B) Describe various TYPES OF FINS found in fishes	10+5
QUESTION NO.5	Discuss the STRUCTURE and FUNCTION of FISH EYE and EAR. Also describe their role in SURVIVAL of fish.	15
QUESTION NO.6	Compare the taxonomic characters of family CYPRINIDAE and SILURIDAE	15
QUESTION NO.7	A) Give a detail account of different METHODS OF FISH FEEDING. B) What is the ROLE of different MOUTHPARTS in feeding?	10+5
QUESTION NO.8	A) Discuss PERIPHRAL NERVOUS SYSTEM (PNS) in fish. Draw diagram for presentation if necessary. B) What do you know about ZOOLOGICAL NOMENCLATURE?	10+5
QUESTION NO.9	Write a note on A) VITAL ORGANS in fish B) GILL STRUCTURE in fishes?	7.5+7.5



UNIVERSITY OF THE PUNJAB
M.A./M.Sc. Part – II Annual Examination – 2020

Roll No.

Subject: Zoology

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

Time: 3 Hrs. Marks: 75

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

- Q.1:** Write a brief account of any three orders. (5, 5, 5)
- a) Mallophaga
 - b) Siphonaptera
 - c) Dictyoptera
 - d) Dermaptera
 - e) Embioptera
- Q.2:** a) Give diagnostic characters of order Hymenoptera (3,12)
b) Write note on three families of hymenoptera.
- Q.3:** Give diagnostic features of order Lepidoptera. Give economic importance of any three families of Lepidoptera. (3,12)
- Q.4:** a) Give scientific names of pest of sugarcane? (5,10)
b) Give life cycle of any one pest of sugarcane.
- Q.5:** Write a detailed account of Pyrethroids. (15)
- Q.6:** Discuss attributes of beneficial organisms in biological control. (15)
- Q.7:** What is colonization? Describe different steps involved in establishing effective Colonization. (15)
- Q.8:** Write notes on any three of the followings: (15)
- a) Apidae
 - b) Lacciferidae
 - c) Dactylopiidae
 - d) Xylococcidae
 - e) Homotomidae
- Q.9:** Explain different types of house hold pests and their control measures. (15)



UNIVERSITY OF THE PUNJAB
M.A./M.Sc. Part – II Annual Examination – 2020

Roll No.

Time: 3 Hrs. Marks: 75

Subject: Zoology

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

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

- Q.1 Describe in detail regulation of heart cycle?
- Q.2 Describe structure and functions of renal glands.
- Q.3 Name digestive hormones and their physiological actions.
- Q.4 Explain fine cardiac structure and how cardiac functioning is checked by ECG?
- Q.5 Explain function and structure of nephron.
- Q.6 What is exocrine function of liver? Also explain structural organization of liver.
- Q.7 Give detailed account on pulmonary epithelium functions.
- Q.8 Describe kidney stones. How these are removed?
- Q.9 Write note on the following:
- a) Type II diabetes
 - b) Structure of an artery
 - c) Liver necrosis



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Roll No.

Subject: Zoology

Paper: IV-5B (Microbiology-'B' Applied Microbiology)

Time: 3 Hrs.

Marks: 75

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

- Q. 1 a) Give a comprehensive note on Humoral immunity. 8
 b) Explain mechanisms of antibody diversity. 7
- Q. 2 Write comprehensive historical highlights of chemotherapy. 15
- Q. 3 Describe the preservation of food in detail. 15
- Q. 4 Discuss role of microorganism in nitrogen cycle in detail. 15
- Q.5 What is meant by waste water? Explain various steps involved in waste
 water treatment. 15
- Q.6 Discuss control of microorganism by 15
 a) Phenol
 b) Halogens
 c) Detergents
- Q.7 Write a detailed note on interferon and phagocytes. 15
- Q.8 What is meant by A-B toxin? Discuss the mechanism of action of cholera
 and botulinum toxin 15
- Q.9 Discuss recommended uses and limitations of following methods for
 controlling microorganisms. 15
 a) Autoclave b) Incineration c)Filtration d) Washing e) Radiation



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

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 | Describe the developmental stages from fertilization up to gastrulation in fishes. | 15 |
| Q 2 (a) | Explain fish feed ingredients of plant origin in detail. | 8 |
| (b) | Write about swim bladder as sound reception in fishes | 7 |
| Q 3 | Give a comprehensive note on gill ventilation in fishes. | 15 |
| Q 4 (a) | Discuss thyroid and adrenal gland in fishes in detail. | 8 |
| (b) | Describe the digestion and absorption in fishes. | 7 |
| Q 5 (a) | Discuss structure and function of kidney in freshwater fishes. | 8 |
| (b) | Give a comprehensive note on digestive system of stomach less fishes. | 7 |
| Q 6 (a) | How water quality parameters effect on growth of fishes? Discuss | 8 |
| (b) | Write comprehensive note on patterns of fish migration. | 7 |
| Q 7 | Write comparative note on structure of heart in fishes with suitable sketches. | 15 |
| Q 8 | Describe induce breeding in carp in detail. | 15 |
| Q 9 | Write a short note on the following | |
| | a) Skin in fishes | 5 |
| | b) Catadromous fishes | 5 |
| | c) Osmoregulation in Elasmobranchs | 5 |



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part - II Annual Examination - 2020

Subject: Zoology

Paper: V-1 (Integrated Pest Management)

Roll No.

Time: 3 Hrs. Marks: 75

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

Q1.	a) Write a note on Economic Threshold b) Discuss mode of actions of insecticides	8 7
Q2	Describe different Pest Management Strategies.	15
Q3	Write a detail note on different biological control agents.	15
Q4	Describe different ecological management practices to control pest population.	15
Q5	Describe chemical classification of insecticides.	15
Q6	Write a detail note on Environmental Economic Injury Level.	15
Q7	What is ecological Backlash? How we can manage it.	15
Q8	Discuss Genetic Control of pest population.	15
Q9	Write note on : a) Crop Rotation b) Augmentation of Biocontrol Agents c) Sub-Economic Pests	5x3



UNIVERSITY OF THE PUNJAB
M.A./M.Sc. Part – II Annual Examination – 2020

Roll No.

Subject: Zoology

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

Time: 3 Hrs. Marks: 75

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

- Q1. a). Give diagnostic characters of order Diptera? [3, 12]
b). Write notes on the morphology & bionomics of any three families of order Diptera?
- Q2. Give diagnostic features of order Hemiptera. Give economic importance of any three important families? [15]
- Q3. Write note on the following: [15]
1. Order Odonata
2. Order Siphunculata
- Q4. Explain Biology and Lifecycle of any two pest of Rice crop? [15]
- Q5. Write a detailed account on Organophosphates? [15]
- Q6. What are the different step involved in establishing an effective Biological Control Program? [15]
- Q7. what is Colonization? Describe different steps involved in establishing effective colonization? [15]
- Q8. Write note on any three of the following: [15]
a. Vespidae
b. Bombycidae
c. Culicidae
d. Coccinellidae
e. Reduviidae
- Q9 Write note on [15]
1. Economic Threshold
2. Economic Injury level



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

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. | a) Describe in detail Hypogonadism in male. | 6 |
| | b) Describe the role of pineal gland in controlling seasonal fertility in some animals. | 9 |
| Q. 2. | Give a detailed account of Abnormalities of Growth hormone secretion. | 15 |
| Q. 3. | Discuss, comprehensively, the structure and function of G Protein-Coupled receptors. | 15 |
| Q. 4. | Discuss, in detail, how cortisol is important in resisting stress and inflammation. | 15 |
| Q. 5. | What are the causes and consequences of rickets in children? Give details. | 15 |
| Q. 6. | Discuss comprehensively, the pathophysiology of parathyroid hormone | 15 |
| Q. 7. | Describe, in detail, the causes and consequences of Type 2 Diabetes mellitus. | 15 |
| Q. 8. | Tabulate the sources, chemical nature and biological effects of hormones released by pituitary glands? | 15 |
| Q. 9. | Write notes on the following: | |
| | a) Idiopathic non toxic colloid goiter | 8 |
| | b) Endemic colloid goiter | 7 |



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

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 | Describe the different types of diseases caused by bacteria in fishes in detail. | 15 |
| Q. 2 | How will you prepare artificial fish feed? Discuss in detail. | 15 |
| Q. 3 (a) | Discuss about fish preservation in detail. | 8 |
| (b) | Explain the role of pond fertilization in pond productivity. | 7 |
| Q. 4 (a) | Discuss the criteria used for site selection of fish farm. | 8 |
| (b) | Write a note on aqua-feed ingredients of plant origin in detail. | 7 |
| Q. 5 (a) | Give a comprehensive note on fish enemies and their control. | 8 |
| (b) | Write a note on natural breeding of fishes in ponds. | 7 |
| Q. 6 (a) | Explain the types of fish ponds with suitable sketches. | 7 |
| (b) | Write a detail note on different types of fish culture. | 8 |
| Q. 7 | Describe the role of natural food for fish culture in a fresh water pond. | 15 |
| Q. 8 | Discuss the establishment of model carp fish farm with suitable sketches. | 15 |
| Q. 9 | Write a short note on the following | 5 |
| | a) integrated fish farming | 5 |
| | b) algal bloom in fish pond | 5 |
| | c) predation process among fishes | 5 |



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Subject: Zoology

Paper: V-18 (Fundamentals of Microbiology)

Roll No.

Time: 3 Hrs. Marks: 75

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

- Q. 1 a-) Explain how bacteria are classified with reference to their genetic relatedness. 10
b-) Write about grouping of bacteria with respect to their optimum growth pH. 05
- Q. 2 Give a comprehensive note on different nutritional types of bacteria with respect to their carbon and energy sources. 15
- Q. 3 Give a detail account of history of microbiology as a foundation of modern science. 15
- Q. 4 How would you determine number of generations that have taken place within a period of 24 hrs if you knew the initial (at time of inoculation) bacterial population and the population after growth has occurred. 15
- Q. 5 a-) Write a note on importance and formation of bacterial endospores. 05
b-) Describe different methods used for obtaining pure cultures of bacteria 10
- Q. 6 Elaborate why oxygen is lethal to anaerobic bacteria and describe different methods for cultivation of an-aerobic bacteria. 15
- Q. 7 Discuss fine structure and different types of bacterial flagella. Also elaborate the mechanism of bacterial motility. 15
- Q. 8 a-) Discuss Numerical Taxonomy in detail. 10
b-) Mention different modes of bacterial cell division. 05
- Q. 9 Write short notes on the followings.
a-) Colony morphology 08
b-) Dark field microscope 07



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Roll No.

Subject: Zoology

Paper: V-20 (Mammalogy)

Time: 3 Hrs. Marks: 75

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

No. 1	Explain the characteristics which differentiate MARSUPIALS from MONOTREMES.	15
No. 2	i- Give a detailed account on TERRITORY and TERRITORIAL BEHAVIOR in mammals. ii- Differentiate between HIBERNATION and AESTIVATION in mammals.	10 5
No. 3	Write down the CLASSIFICATION and DISTRIBUTION of the following mammals. a) Flying fox b) Black bear c) Whale d) Echidna e) Asian Elephant f) Giraffe	2.5x6=15
No. 4	i- Discuss food STORAGE in mammals. ii- Differentiate between order CETACEA and SIRENA in detail.	2x7.5=15
No. 5	i- Differentiate between the PERISSODACTYLA and ARTIODACTYLA. ii- Write down a comprehensive note on the ECHOLOCATION in BATS .	2x7.5=15
No. 6	Write a detailed note on trends in EVOLUTION of MAMMALIAN MOLARS.	15
No. 7	Give the detailed discussion on the following MOVEMENT PATTERNS of MAMMALS. a) Arboreal b) Fossorial c) Leaping d) Gliding e) Flying	3x5=15
No. 8	Give the CLASSIFICATION of MAMMALS on the basis of DIETARY PATTERNS.	15
No. 9	Explain the Morphology, Reproduction and Paleontology of MONOTREMES.	15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Subject: Zoology Paper: V-21 (Immunology)

Roll No.

Time: 3 Hrs. Marks: 75

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

1	a) How do the physiological barriers provide protection against the pathogens? b) What are the characteristics of inflammatory responses?	8 7
2	a) Enlist different organs of immune system. What effects does thymectomy (removal of thymus) have on a neonatal mouse and on adult mouse, explain why these effects differ. b) Draw structure of lymph node.	8 7
3	What is the structure of antibody (IgG) molecule? Enlist mechanisms of antibody diversity.	15
4	Write a note on mechanisms involved in T-helper cell functioning	15
5	What is MHC complex? Discuss its various types and their structure in detail	15
6	Briefly describe the similarities and differences among cytokines, growth factors, and hormones.	15
7	a) What are Immunologic Basis of Graft Rejection b) Explain its sensitization and effector stages of Cell-Mediated Graft Rejection.	8 7
8	Write short notes on the following a. Flow cytometry b. Haemagglutination	8 7



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Roll No.

Subject: Zoology

Paper: V-22 (Vector Biology)

Time: 3 Hrs. Marks: 75

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

- Q.1. a) Give an account of the life cycle of Black FLY 8
b) Explain ONCHOCERCIASIS 7
- Q.2. a) Describe life cycle of Tabanid 7
b) Explain Loiasis 8
- Q.3. What are different control strategies for the followings 8,7
a) Flesh flies
b) Horse fly
- Q.4. Discuss life cycle and control practices for Green bottles 15
- Q.5. What is Myiasis? Describe different types in detail. 15
- Q.6. Explain morphology and control measures of Tsetse fly 15
- Q.7. Describe life cycle and medical importance of Bot fly (*Dermatobia hominis*) 15
- Q.8. Write a detailed note on the life cycle and control measures of Sand fly 15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Subject: Zoology

Paper: V-26 (Human Embryology & Teratology)

Roll No.

Time: 3 Hrs. Marks: 75

**NOTE: Attempt any FIVE questions. Draw labelled sketches where ever feasible.
All questions carry equal marks.**

- Q. 1.** DISCUSS DEVELOPMENT OF **EXCRETORY** SYSTEM IN DETAIL, ALSO DISCUSS ITS EMBRYONIC ABNORMALITIES.
- Q. 2.** WRITE AN ACCOUNT ON **ENVIRONMENTAL TERATOGENS**
- Q. 3.** WRITE A ESSAY ON **PLACENTAL DEVELOPMENT AND FUNCTIONS**
- Q. 4.** DISCUSS MAJOR EMBRYONIC ANOMALIES OF **CENTRAL NERVOUS SYSTEM**
- Q. 5.** DESCRIBE THE DEVELOPMENT OF **TESTIS** ALSO GIVE ITS EMBRYONIC DEFECTS.
- Q. 6.** DESCRIBE THE PROCESS OF **CLEAVAGE** AND **GASTRULATION** IN HUMANS.
- Q. 7.** EXPLAIN THE **OVARIAN CYCLE** IN DETAIL WITH REFERENCE TO THE HORMONAL CONTROL MECHANISMS
- Q. 8.** DESCRIBE THE DEVELOPMENT OF **EYE** ALSO EMPHASIZE ITS EMBRYONIC DEFECTS.
- Q. 9.** WRITE NOTES ON **ANY TWO** OF THE FOLLOWINGS:
- I. **MONOZYGOTIC TWINS**
 - II. **IMPLANTATION**
 - III. **TERATO-SPERMIA**



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Subject: Zoology

Paper: V-27 (Cancer Biology)

Roll No.

Time: 3 Hrs. Marks: 75

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

- Q. 1 a) What is carcinoma and sarcoma? Describe different types of carcinoma and sarcoma. 8
b) What is Warburg effect? Describe its importance in cancer cells. 7
- Q. 2 What is telomerase? Describe its role in cancer tumorigenesis. 15
- Q. 3 a) What is benzo(a)Pyrene (B[a]P)? Describe its sources and role in various human cancers. 8
b) Describe non-canonical activation of NF- κ B pathway. 7
- Q. 4 a) Write a comprehensive note on cancer diagnostic markers? 8
b) How does C-Oncogenes differ from V-Oncogenes? 7
- Q. 5 What are signal molecules? Describe different types of intercellular signaling molecules. 15
- Q. 6 a) Describe TNM staging system of cancer. 8
b) What are receptors? Differentiate between intracellular receptors and membrane receptors with examples. 7
- Q. 7 What is Rous Sarcoma virus (RSV)? Describe genomic structure of RSV. 15
- Q. 8 a) Write a note on cancer invasion. 8
b) What is lymphoma? Describe its different types 7
- Q. 9 a) Describe structure of receptor tyrosine kinases. 7
b) How is Protein Kinase A (PKA) activated via cAMP? 8



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Roll No.

Subject: Zoology

Paper: V-29 (Molecular Biology)

Time: 3 Hrs. Marks: 75

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

- Q.1. What is recombinant DNA technology? Discuss the enzymes used in recombinant DNA technology 15
- Q.2. Describe the assembly of RNA polymerase II at *E coli* promotor region also discuss transcription initiation and elongation .. 15
- Q.3. a) Differentiate between the structure of ribosomes of prokaryotes and eukaryotes. 7
- b) How the thymidine dimer are repair by photo- reactivation process? 8
- Q.4. Give the features of cloning and expression vectors with suitable examples 15
- Q.5. a) What is blotting? How to identify specific DNA fragments by southern blots? 7.5
- b) Discuss the characteristics of three DNA polymerases of prokaryotes 7.5
- Q.6. Discuss the three steps procedure of translation in prokaryotes 15
- Q.7. a) What are the remodelers? Describe the mechanism of nucleosome remodeling 7
- b) What is chromatography give in detail the principle to separate a protein according to their charge by Ion- Exchange Chromatography? 8
- Q.8. Describe the cascade of events for the regulation of *trp* operon in *E.coli*. 15
- Q.9. Write notes on two of the following 7.5+7.5
- (a) Forms of DNA (A, B and Z)
- (b) Base excision repair (BER).
- (c) Types of promoters in eukaryotes



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Subject: Zoology

Paper: V-30 (Virology & Viruses)

Roll No.

Time: 3 Hrs. Marks: 75

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

Q.1.	Describe the properties of viruses. Discuss symmetry, genome, morphology of viruses.	18.75
Q.2.	Write a comprehensive note on the nature of viruses.	18.75
Q.3.	What is translation. Explain the process of translation in capped, naked, bicistronic viruses	18.75
Q.4.	Give comprehensive account on the viral attachment and entry into the host cells.	18.75
Q.5.	How the viruses attach and enter into the host cells? explain	18.75
Q.6.	How the virions exit from the infected cells after assembly of the viruses is completed.	18.75
Q.7.	Give a comprehensive account on Covid-19 viral infection.	18.75



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Subject: Zoology

Paper: V-40 (Air Pollution Monitoring)

Roll No.

Time: 3 Hrs. Marks: 75

NOTE: Attempt any FIVE questions. Make labelled sketches to support your answer where ever necessary. All questions carry equal marks.

1. Describe in detail the industrial melanism
2. Describe the health impact and economic assessments of air pollution.
3. What is indoor air pollution gives its common types.
4. Describe with diagram aerosol spectrometer and dust monitors along with DMA
5. What is aerosol and explain its size and optical properties with flow chart diagrams.
6. a. Write a note on removal and lifetimes of aerosol particles.
b. Write a note on dispersal of bio-aerosols in the atmosphere with diagram.
7. Write a notes on
 - a. Removal and lifetimes of aerosol particles.
 - b. Air borne diseases
8. Describe Green house effect, global warming and its impact on environment.
9. Define the following terms.
 - I. Fume
 - II. Dust
 - III. Fog
 - IV. An aerosol
 - V. Haze
 - VI. Mist
 - VII. Particle
 - VIII. Smog
 - IX. Genotoxicity
 - X. Smoke
 - XI. Soot
 - XII. Tolerance
 - XIII. Acid rain
 - XIV. What is Beer Lambert Law
 - XV. SMPS



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2020

Subject: Zoology

V-41 (Communicable Diseases and Environmental Health)

Roll No.

Time: 3 Hrs. Marks: 75

**NOTE: Attempt any FIVE questions in all, while Question No. 1 is compulsory.
All questions carry equal marks.**

Question 1. Define any ten of the following:

1. Environmental health
2. Case-fatality rate
3. Terminal cleaning
4. Disinfestation
5. Epidemic
6. Fumigation
7. Herd immunity
8. Incidence
9. Infectious agent
10. Insecticide
11. Mortality rate
12. Pandemic
13. Modified quarantine
14. Reservoir of infectious agents
15. Unapparent infection (asymptomatic infection)

Question 2. Write different mode and types of transmission.

Question 3. Write details of disinfection and its types.

Question 4. Which populations suffer most from environmental hazards to health?

Question 5. What is the major cause of mortality in your country?

Question 6. What is the effect of host genetic diversity on the spread of infectious diseases?

Question 7. Write a short note on any two of the following diseases.

- a) Musculoskeletal diseases
- b) Road traffic accidents
- c) Interpersonal violence

Question 8. What are causing agents, incubation period and recovery of any two of the following diseases?

- a) Respiratory infections
- b) Intestinal nematode infections
- c) Trachoma

Question 9. Write a summary note on prevention of any two of the following diseases.

- a) Fires, heat and hot substances
- b) HIV/AIDS and sexually transmitted diseases
- c) Cardiovascular diseases