



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

Roll No.

Subject: Zoology

Paper: I (Environmental Biology)

Time: 3 Hrs. Marks: 75

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

1	i). "MYTHS OF POLLUTION CONTROL frequently lead to costly political and economic decisions." Can you justify the statement? ii). What are the LIMITS OF POPULATION GROWTH?	8 7
2	i). Define the BIOGEOCHEMICAL CYCLE. How does PHOSPHORUS move between different spheres? ii). Discuss in detail the impact of GEOGRAPHY, CLIMATE and HUMAN INTRUSION on BOREAL FORESTS.	7 8
3	i). Discuss the role of PHYSICAL, CHEMICAL and BIOLOGICAL factors on PRIMARY PRODUCTIVITY of an ecosystem. ii). How does HUMAN ACTIVITIES cause the OZONE DEPLETION?	9 6
4	i). "Some species are more important than the others in an ecosystem? Justify the statement ii). "AGE STRUCTURE of a POPULATION affects its GROWTH." Explain.	7 8
5	i). Develop an overview of past and present status and impact of BIOLOGICAL WARFARE in national economy ii). Briefly discuss DEFORESTATION, giving its causes and future impacts.	10 5
6	i). "SYNTHETIC ORGANIC POLLUTANTS have a more serious effect on environment degradation." Discuss the statement. ii). How do various PHYSICAL AND BIOLOGICAL FACTORS control the size of a POPULATION SIZE?	7 8
7	i). "CARBON CONCENTRATION works as THERMOSTAT of the earth." Discuss the statement. ii). Discuss the STRATIFICATION in a FRESHWATER ECOSYSTEM.	6 9
8	i). Define COMPETITION. Can you justify the statement that INTRASPECIFIC COMPETITION is more severe than INTERSPECIFIC COMPETITION? ii). Write a note on OXYGEN DEMANDING wastes?	9 6
9	i). How does the environmental problems affect the public health and economic productivity of a nation? ii). Write a brief not on ACID RAIN	10 5



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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) Discuss origin of life through biogenesis b) Describe different types of Heterochrony	8 7
Q2.	What is Kin selection? Discuss in detail	15
Q3.	a) Discuss how selection and genetic drift are responsible for microevolution b) Discuss Heterozygote Advantage and its role in microevolution.	10 5
Q4.	Describe the factors that can explain imperfect adaptations in organisms.	15
Q5	Write notes on a) Density dependent selection b) Theory of phyletic gradualism c) Causes of linkage disequilibrium	5 5 5
	PART B	
Q6	a) Describe Typological species concept and difficulties in its application. b) Discuss the condition which cause change in nomenclature of taxa	8 7
Q7	Discuss Types of taxonomic publications in detail.	15
Q8	Describe Phenetic classification in detail	15
Q9	Write notes on a) Important Types in nomenclature b) Taxonomic Keys c) Superspecies	5 x 3



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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 IGNEOUS and METAMORPHIC rocks (8+7)= 15
- Q 2. Explain the evolutionary history of ELEPHANTS 15
- Q 3. Write a note: a. Trace Fossils b. Index Fossils (8+7)=15
- Q 4. Write note on SIWALIKS and its subgroups 15
- Q 5. Write a note on CRYPTOZOIC Eon 15

Part-II

Zoogeography

- Q 6. Give in detail physical features, climate and fauna of ORIENTAL REGION 15
- Q 7. Describe BARRIERS and Means of DISPERSALS for Terrestrial animals 15
- Q 8. Explain in detail the existence of different Land Bridges in the past with some suitable examples 15
- Q 9. Write Note: a. OCEANIC Islands. b. CONTINENTAL Islands (8+7)=15
- Q 10. Give the zoogeographical distribution of the following animals
- (i) Newt (ii) Black buck (iii) *Loxodonta* (iv) Kiwi (v) *Okapia* (vi) *Uropeltis*
- (vii) King Cobra (viii) *Oriolus* (ix) *Heloderma* (x) *Xenopus* (1.5each) 15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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 involve in generation of action potential 15
- Q.2 Account, comprehensively, the Phosphatidylinositol derived second messenger system. 15
- Q.3 Discuss, in detail, the generation of cAMP as a second messenger taking the example of glucose mobilization as a response induced by cAMP. 15
- Q.4 a) Write a note on adrenal cortex and its hormones 9
b) Give endocrine functions of liver, heart and adipose tissues 6
- Q.5 a) With the help of labeled figures only, show the hypothalamic control of anterior and posterior lobes of pituitary gland. 6
b) Give a brief account of the hormones of anterior pituitary gland. 9
- Q 6 Give a detailed account of Parkinson's disease 15
- Q.7 Give a detailed account of
a) Depression and Manic-Depressive 9
b) Schizophrenia 6
- Q 8 Briefly described the role of tympanic membrane and the ossicular system in conduction of sound from tympanum to cochlea 15
- Q 9 a) Give a detailed account of sliding filament mechanism of muscle contraction. 9
b) Briefly describe the functions (any three) of muscular tissue 6



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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	Write a comprehensive note on Blood-Brain Barrier.	15
Q.2	Describe structure and function of Aquaporin water channels	15
Q.3	Explain the main functions of enterocytes.	15
Q.4	How hypertension is controlled by Renin- Angiotensin- Aldosterone system?	15
Q.5	How does the endothelium participate in the structural and functional integrity of the vascular wall?	15
Q.6	Describe filtration apparatus of renal corpuscles.	15
Q.7	Explain the molecular mechanism of blood vessel vasodilation and Vasoconstriction.	15
Q.8	Explain the functions of hepatocytes.	15
Q.9	What is hypertension? How hypertension causes ventricular hypertrophy?	15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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 | Write about contributions of Antony van Leewenhoek, Louis Pasteur and Robert Koch to the development of the microbiology in details. | 15 |
| Q. 2 | Give a comprehensive note on different methods used for quantitative measurement of bacterial growth. | 15 |
| Q. 3 | Discuss working principles and specific applications of bright field and electron microscopy. | 15 |
| Q. 4 | Give a comprehensive note on cultural characteristics of bacteria. What is the importance of studying cultural characteristics of bacteria? | 15 |
| Q. 5 | Write a detailed note on different nutritional groups of microorganisms. | 15 |
| Q. 6 | a) Describe major characteristics of microorganisms | 8 |
| | b) Write a note on numerical taxonomy. | 7 |
| Q. 7 | a) Discuss characteristics of algae in detail. | 8 |
| | b) Discuss importance of Mycorrhizas. | 7 |
| Q. 8 | Discuss differences between Gram's negative and Gram's positive bacteria with the help of labelled diagrams. | 15 |
| Q. 9 | Write note on the followings: | |
| | a- Bacterial endospores | 05 |
| | b- Acidophiles and Halophiles | 05 |
| | c- Synchronous growth | 05 |



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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 | Write a detailed account on different classes of immunoglobulin. | 15 |
| Q. 2 | How many major groups of chemical antimicrobial agents? Discuss the mode of action of any four agents used to control microbes. | 15 |
| Q. 3 | Describe various aspects of microbial involvement in petroleum | 15 |
| Q. 4 | Write a note on recommended uses and limitations of different physical method used to control the microorganism. | 15 |
| Q. 5 | a) Explain the source and mode of action of penicillin and tetracyclines. | 8 |
| | b) Describe the events in infection following penetration | 7 |
| Q. 6 | Discuss the role of microbes in nitrogen cycle. | 8 |
| | b) Describe the effect of holding temperature of raw milk on numbers and types of bacteria | 7 |
| Q. 7 | a) Give a comprehensive note on tetanus and cholera toxin. | 8 |
| | b) List the major conditions influencing the effectiveness of antimicrobial chemical agents | 7 |
| Q. 8 | What is meant by waste water? Discuss waste water treatment in detail. | 15 |
| Q. 9 | Give an account on various methods of food preservation | 15 |



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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.

1. What is the importance of swim bladder in fish? Explain its various functions in detail.
2. What are the major feeding types of fish? Explain in detail.
3. Give an account of dentition in fish. What are various kinds of teeth in fish and their respective functions?
4. Explain social factors in fish ecology.
5. Role of biogeochemical cycles in inorganic productivity of the aquatic ecosystem.
6. Describe in detail the skull and its major parts in fish.
7. Describe the fish digestive system and its working
8. Describe the type and function of scales in fishes with diagrams.
9. Write a note on the followings:-
 - a) Types of the tail in different groups of fishes
 - b) Fish Brain
 - c) Fish kidney



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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) | Describe the structure and function of kidney in fishes. | 8 |
| Q. 1 (b) | Give an account on the reasons of fish migrations in detail. | 7 |
| Q. 2 | What are the differences between enzyme and hormones? Write a detail note on pituitary gland in fishes. | 15 |
| Q. 3 | Discuss adaptation of digestive tract in fishes | 15 |
| Q. 4 (a) | Discuss osmoregulation in freshwater fishes. | 8 |
| Q. 4 (b) | Explain the oogenesis process in fishes. | 7 |
| Q. 5 | Write a comprehensive note on swim bladder in fishes. | 15 |
| Q.6 (a) | Describe the factors affecting on fish growth. | 8 |
| Q.6 (b) | Give a comprehensive note on Gastrulation in fishes. | 7 |
| Q. 7 | Describe the artificial breeding in fresh water fishes. | 15 |
| Q. 8 (a) | Describe the gill ventilation in fishes with suitable sketches. | 8 |
| Q. 8 (b) | Write a note on various feed ingredients of animal origin. | 7 |
| Q. 9 (a) | Write a note on structure of heart in fishes? | 8 |
| Q. 9 (b) | Write a comprehensive note on skin and scales of fishes. | 7 |



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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.

- Q1. Explain nervous system of an insect and its physiology? [15]
- Q2. What do you mean by spiracle? Explain the structure of different types of spiracles? [15]
- Q3. Discuss structure, composition and function of cuticle with labelled sketch? [15]
- Q4. Give a detailed account on Insect coloration? [15]
- Q5. Write down different types of mouthparts of insects? [15]
- Q6. Briefly discuss exocrine glands in insects? [15]
- Q7. Write down different types of reproduction in insects? [15]
- Q8. Write a brief account of different type of legs of Insects [15]
- Q9. Explain the digestive system with special reference to foregut and Midgut? [15]



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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 general account and classification of order Lepidoptera	15
Q2	Describe Diagnostic characters of any three orders a) Dermaptera b) Zoraptera c) Siphunculata d) Mallophaga	5x3
Q3	Write a detail note on different biological control agents.	15
Q4	Describe Diagnostic characters of any three order a) Protura b) Odonata c) Mallophaga d) Embioptera	5x3
Q5	Write notes on any two insects of economic importance	15
Q6	a) Write a note on Economic Threshold b) Discuss Types of wet formulations of insecticides	8 7
Q7	Describe different Pest Management Strategies.	15
Q8	Describe different groups of synthetic insecticides on the basis of chemical composition	15
Q9	Write notes on a) Economic importance of Orthoptera b) Types of pests c) Problems related with use of insecticides	5x3



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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	a) Discuss biocontrol potential of microorganism. b) Discuss Introduction of Biological Control Agents (pros and cons).	9 6
Q2	Discuss type and mode of action of modern insecticides.	15
Q3	What is ecological Backlash? How can we manage it.	15
Q4	Describe different ecological management practices to control pest population.	15
Q5	Describe different types chemicals used in the preparation of formulations of insecticide and their role.	15
Q6	Describe how resistant cultivar function to reduce the effects of insect attacks.	15
Q7	Discuss major factors in detail that bring changes in economic decision level	15
Q8	Write a note on pest management strategies and tactics	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 – 2022

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. | Describe the physiological characteristics of Hypothyroidism with special emphasis on Myxedema and Cretinism. | 15 |
| Q. 2.(A) | Name the cellular source and target organs/ glands of each of the following hormones; Glucagon, oxytocin, cortisol, calcitonin, epinephrine, progesterone, aldosterone, estrogen and testosterone. | 10 |
| (B) | What is acromegaly? Give brief description. | 05 |
| Q. 3. | Account, comprehensively, the causes and consequences of Type 1 Diabetes mellitus? | 15 |
| Q. 4. | In cell-signalling pathways, describe with the help of a G protein cycle, the involvement of GTP binding proteins as switches that turn the activities on or off? | 15 |
| Q. 5. | Describe, in detail, the role of calcium as an intracellular messenger in cell signaling pathways. | 15 |
| Q.6. | Tabulate the sources, chemical nature and biological effects of hormones released by pituitary gland? | 15 |
| Q. 7. | Write notes on the following:
A) Hormones involved in stress response | 08 |
| | B) Idiopathic non toxic colloid goiter | 07 |
| Q. 8. | Give a detailed account of causes, consequences and treatment options of Hyperadrenalism-Cushing's syndrome? | 15 |
| Q. 9. | Discuss, comprehensively, the structure and function of G Protein-Coupled receptors? | 15 |



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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 Write about freshwater aquatic weeds. Discuss biological, chemical and mechanical control of aquatic weeds. 15
- Q. 2 a) Write the impact and their control of following organisms on fish 10
i) Birds ii) Mammals iii) Amphibians
b) Give an account on detrimental effects of chemicals on fishes. 5
- Q. 3 Give a comprehensive note on fish hatchery with suitable sketches. 15
- Q. 4 Discuss varieties of organic and inorganic fertilizers for fish ponds, Dose of fertilizers and its uses. 15
- Q. 5 What is meant by fish cultivation? How will you design and construct a carp fish farm? 15
- Q. 6 Give a comprehensive note on plant and animal origin feed ingredients. 15
- Q. 7 Discuss different types of fish culture in detail. 15
- Q. 8 Write a detailed note on artificial breeding in carps 15
- Q. 9 Write about fish netting, transportation for market, maintenance of flesh quality and price control 15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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 | Discuss limitations of different methods used for quantitative measurements of bacterial growth. | 15 |
| Q. 2 | 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. 3 | Give a comprehensive note on different nutritional types of bacteria with respect to their carbon and energy sources. | 15 |
| Q. 4 | Give a detail account of history of microbiology as a foundation of modern science. | 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 anaerobic bacteria. | 15 |
| Q. 7 | Write in detail about the 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 – 2022

Roll No.

Subject: Zoology

Paper: V-20 (Mammalogy)

Time: 3 Hrs. Marks: 75

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

1	Give diagnostic features and affinities of Metatheria.	15
2	Differentiate between: a-Immigration and Emigration b-Artiodactyla and Perissodactyla c-Hibernation and Aestivation	3x5=15
3	a-Write a note on different types of placentae in mammals. b-Describe Carnassial teeth in carnivora.	2x7.5
4	Discuss the followings: a-Food and food storage in mammals b-Claws and Hoofs c-Nails and Hairs	3x5=15
5	Describe different modes of locomotion in mammals.	15
6	Classify mammals according to their diets.	15
7	Describe dentitions in mammals.	15
8	Write a short note on the followings: a-Flight in mammals b-Different parts of a ruminant stomach and their functions.	2x7.5
9	Write characteristics of: a-Triconodonta b-Symmetrodonta c-Multituberculata	3x5=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?	8
	b) What are the characteristics of inflammatory responses?	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.	8
	b) Draw structure of lymph node.	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	8
	b) Explain its sensitization and effector stages of Cell-Mediated Graft Rejection.	7
8	Write short notes on the following	
	a. Flow cytometry	8
	b. Haemagglutination	7



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

Roll No.

Subject: Zoology

Paper: V-22 (Vector Biology)

Time: 3 Hrs.

Marks: 75

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

- Q1. Write a detailed note on the control of mosquitoes? [15]
- Q2. a). Give an account of the Life cycle of sand fly? [8]
- b). Explain Leishmaniasis [7]
- Q3. What are the different control strategies for the following [8,7]
- a). Black fly
- b). Tsetse fly
- Q4. Explain life cycle & medical importance of Bot fly (*Dermatobia hominis*) [15]
- Q5. write note on the following: [8,7]
- a). Malaria
- b). Trypanosomiasis
- Q6. Write a detailed note on the morphology and control of a flea? [15]
- Q7. Explain morphology and control measures of biting midges? [15]
- Q8. a). Give an account of the Life cycle of Horse fly? [8]
- b). Explain Loiasis [7]
- Q9. a). Write principal characters to distinguish anopheline and culicine mosquitoes? [12]
- b). What are Arboviruses? [3]



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

Roll No.

Subject: Zoology

Paper: V-26 (Human Embryology & Teratology)

Time: 3 Hrs.

Marks: 75

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

- Q. 1. DISCUSS THE EMBRYONIC DEVELOPMENT OF HUMAN HEART AND FETAL BLOOD CIRCULATION**
- Q. 2. WRITE AN ACCOUNT ON ENVIRONMENTAL TERATOGENS AND THEIR EFFECTS ON THE HUMAN EMBRYO**
- Q. 3. DISCUSS THE EMBRYONIC DEVELOPMENT OF EXTRA EMBRYONIC MEMBRANES AND PLACENTA**
- Q. 4. DISCUSS THE DEVELOPMENTAL ANOMALIES OF CENTRAL NERVOUS SYSTEM AND THEIR MAJOR CAUSES**
- Q. 5. DESCRIBE THE DEVELOPMENT OF MALE REPRODUCTIVE SYSTEM AND ITS DEVELOPMENTAL ABNORMALITIES**
- Q. 6. DESCRIBE THE PROCESS OF CLEAVAGE AND GASTRULATION IN HUMANS.**
- Q. 7. DESCRIBE THE PROCESS OF FERTILIZATION, PREIMPLANTATIONAL DEVELOPMENT AND IMPLANTATION OF HUMAN EMBRYO**
- Q. 8. DESCRIBE THE EMBRYONIC DEVELOPMENT OF HUMAN EYE AND ITS ABNORMALITIES WITH REFERENCE TO THE SERIAL INDUCTIONS INVOLVED**
- Q. 9. WRITE SHORT NOTES ON THE FOLLOWINGS:**
 - I. MONOZYGOTIC TWINS**
 - II. EXTRA EMBRYONIC MESODERM**
 - III. HYDROCEPHALY AND ANENCEPHALY**



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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	What is carcinoma and sarcoma? Describe different types of carcinoma and sarcoma.	15
Q. 2	What is ductal and lobular breast carcinoma? Describe various types of breast cancer on molecular basis.	15
Q. 3	What is benzo(a)Pyrene (B[a]P)? Describe its sources and role in various human cancers.	15
Q. 4	What is Hayflick limit? Explain how do cancer cells bypass Hayflick limits for uncontrolled cell proliferation?	15
Q. 5	What is Warburg effect? Describe the role of Aerobic glycolysis in cancer cell metabolism.	15
Q. 6	Describe TNM staging system of cancer	15
Q. 7	What is Rous Sarcoma virus (RSV)? Describe genomic structure of RSV.	15
Q. 8	What is STAT3? Describe how activation of STAT3 is regulated by positive and negative regulators.	15
Q. 9	Write a note on following 1. Cancer invasion 2. Ki-67 3. EMT	5x3=15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

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.	Q. Discuss the process of DNA replication in Eukaryotes.	15
Q.2.	Q. Give the assembly of transcription factors for the initiation of transcription on tRNA and rRNA promoters.	15
Q.3.	Q. 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.	Q. a) How DNA libraries are prepared?	6
	b) What is DNA finger printing and DNA typing? Explain their forensic uses.	9
Q.5.	a) Describe packaging of DNA into a chromosome.	8
	b) Explain the acetylation of histone and its effect on transcription.	7
Q.6.	Q. 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.	Ex Explain the procedure of Southern blotting for the molecular analysis of DNA	15
Q.		
Q.9	Write notes on two of the following: (a) Photoreactivation repair. (b) Types of promoter and their structure (c) Micro RNA and RNAi.	7.5x2= 15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

Roll No.

Subject: Zoology

Paper: V-40 (Air Pollution Monitoring)

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. What are gaseous air pollutants? Give detail account of its components.
2. Describe in detail the tropospheric aerosols, its sources, particle formation and transport.
3. Give a detail account of bio-aerosols and its adverse effects on health.
4. Give an account of air pollution in Pakistan.
5. Describe Biological (innate/acquired) susceptibility of air pollution.
6. What are noise pollution and its effects on public health? Also explain the noise pollution standards in Pakistan.
7. Describe the Coliform identification schemes for monitoring the water pollution.
8. What is Particulate matter (PM)? How Does PM Affect Human Health, give WHO standards for PM.
9. Give example of Genetic adaptation in response to air pollution.



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

Roll No.

Subject: Zoology

Paper: V-41 (Communicable Diseases and Environmental Health)

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 Zoonosis
- 2 Prevalence
- 3 Environmental Health
- 4 Repellent
- 5 Cleaning
- 6 Contamination
- 7 Food irradiation
- 8 Insecticide
- 9 Isolation
- 10 Pathogenicity
- 11 Rodenticide
- 12 Carrier
- 13 Susceptible
- 14 Immune individual
- 15 Incubation period

Question 2. How can disinfection be useful in prevention disease spread? Discuss in detail its various types and methods.

Question 3. How can environmental factors be responsible for increased mortalities?

Question 4. How can the general public and policy makers be involved in tackling environmental risks to health?

Question 5. Discuss in detail cost effective measures to combat environmental diseases.

Question 6. What strategies would work irrespective of socio economic differences to empower people to be responsible for their health?

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

- a) Cancers
- ~~b) Interpersonal violence~~
- c) Road traffic accidents

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

- a) Trachoma
- b) Hepatitis B and C
- c) Tuberculosis

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

- a) Lymphatic filariasis
- b) Schistosomiasis
- c) HIV/AIDS



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Annual Examination – 2022

Subject: Zoology

Paper: V-30 (Virology & Viruses)

Roll No.

Time: 3 Hrs. Marks: 75

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

1.	Explain the structural details of viral membrane system.	18.75
2.	Explain the assembly and exit of virions from an animal cell.	18.75
3.	Classify the DNA and RNA viruses of animals	18.75
4.	Discuss different modes of viral transmission.	18.75
5.	Give a comprehensive account on the replication of Single stranded and double stranded RNA in viruses.	18.75
6.	Give detailed account on morphology of bacteriophage	18.75
7.	Give detailed account on infectivity of viruses.	18.75