



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

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 in detail the movement of CARBON as an example of BIOGEOCHEMICAL CYCLE.	7
	ii). Define and explain the mechanism controlling BIOLOGICAL SUCCESSION.	8
2	i). Discuss conditions required for each of the two basic types of POPULATION GROWTH CURVES.	10
	ii). Discuss causes and effects of OZONE LAYER DEPLETION.	5
3	i). "All PREDATORS are KEYSTONE species." Do you support the statement?	8
	ii). "Present stability in ATMOSPHERE and OCEANS is net effect of series on past events." Justify the statement.	7
4	i). Discuss AGE STRUCTURE as a POPULATION CHARACTER.	8
	ii). "TREE PLANTATION is not an ideal alternative for NATURAL MANAGEMENT of FOREST RESOURCES." Discuss the statement.	7
5	i). Define and explain RADIATION POLLUTION.	9
	ii). "PREDATION and PARASITISM have role in controlling ECOLOGICAL POPULATIONS." Justify the statement?	6
6	"BIOLOGICAL WEAPONS are more hazardous than CHEMICAL WAREFARE in effecting national economy." Discuss the statement.	15
7	i). Discuss the SECOND LAW OF THERMODYNAMICS as it works in FOOD CHAIN.	7
	ii). Briefly describe ZONATION of SEA with ECOLOGICAL STANDPOINT.	8
8	i). What is DESERT and DESERTIFICATION? How are the DESERTS formed?	8
	ii). Define an ECOSYSTEM. How is HOMEOSTASIS maintained in an ECOSYSTEM?	7
9	i). Discuss AIR POLLUTION as it effects the life on the earth.	8
	ii). Discuss ENVIRONMENTAL PROBLEMS as these affect PUBLIC HEALTH and ECONOMIC PRODUCTIVITY of a nation.	7



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M.A./M.Sc. Part - II Supply - 2020 & Annual - 2021

Roll No.

Time: 3 Hrs. Marks: 75

Subject: Zoology

Paper: II (Evolution and Principles of Systematic Zoology)

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.	Discuss the role of Mutations, Gene flow and Genetic drift in the process of evolution with the help of examples	15
Q2.	Describe Fisher and Zahavi theories of sexual selection in detail.	15
Q3.	a) What is the cost of selection? Explain b) Discuss reasons of imperfect adaptations in animals.	8 7
Q4.	How fitness is dependent of frequency of individuals? Explain in detail?	15
Q5.	Write notes on a) Allometry b) Genetic load c) Co-evolution	5x3
PART B		
Q6	a) Discuss the Typological Species Concept and problems in its applications. b) What are Polytypic Species? Explain	8 7
Q7	Describe types of Intrapopulation variations.	15
Q8	What is importance of Stability, Priority and First-Reviser Principle in nomenclature? Explain	15
Q9	Write note on a) Concept of taxon b) Phenetic classification c) Type of taxonomic publications	5x3



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M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

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-1

Palaeontology

- Q 1. Write the evolutionary history of ELEPHANTS 15
- Q 2. Write a note on: a. ALTERED Fossils b. UNALTERED Fossils 15
- Q 3. Write a note on: Life History of CENOZOIC Era 15
- Q 4. Write Note on: a. JURASSIC Mammals b. HIPPARION (8+7)=15
- Q 5. Write note on: a. IGNEOUS Rocks b. TRILOBITES (8+7)=15

Part-II

Zoogeography

- Q 6. Give the Zoogeographical distribution of the following animals
(i) Emu (ii) *Dromaius* (iii) Salamander (iv) *Bison* (v) *Caecilia* (vi) *Triturus*
(vii) *Elephas* (viii) King Cobra (ix) *Neoceratodus* (x) *Okapia* (1.5each) 15
- Q 7. Give in detail physical features, climate and fauna of AUSTRALIAN Region 15
- Q 8. Explain PLATE TECTONIC THEORY 15
- Q 9. Describe BARRIERS and Means of DISPERSALS for MARINE Animals 15
- Q 10. Write note on the following; a. COSMOPOLITAN Distribution b. ANCIENT Islands 15



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M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

Subject: Zoology

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

Roll No.

Time: 3 Hrs. Marks: 75

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

- Q1. Give a detailed account of metamorphosis in insects? [15]
- Q2. Write a detailed note on Insect's antennae? [15]
- Q3. Discuss structure, composition and function of cuticle with labelled sketch? [15]
- Q4. Write a detailed account on Insect coloration? [15]
- Q5. Write down different types of mouthparts of insects? [15]
- Q6. Briefly discuss endocrine glands in insects? [15]
- Q7. Write short notes on the following [5,5,5]
- i. Parthenogenesis
 - ii. Malpighian tubules
 - iii. Tentorium
- Q8. What are the General characteristics of insects? [15]
- Q9. Write a note on the Nutrition of insects? [15]



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M.A./M.Sc. Part – II Supply 2020 & Annual – 2021

Subject: Zoology

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

Roll No.

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 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.2 Write comprehensive account on structure and function of G protein coupled receptor 15
- Q.3 How nerve impulse is transmitted from one cell to next? Discuss in detail the events take place during transmission of impulse 15
- Q.4 Give a detailed account of abnormalities of growth hormone secretion 15
- Q.5 Describe, in detail, the causes and consequences of Rickets in children 15
- Q.6 a) Give a detailed account of sliding filament mechanism of muscle contraction. 9
b) Briefly describe the functions (any three) of muscular tissue 6
- Q.7 Give a detailed account of
a) Depression and Manic-Depressive 7.5
b) Schizophrenia 7.5
- Q.8 a) Write a note on adrenal cortex and its hormones 9
b) Give endocrine functions of liver, heart and adipose tissues 6
- Q.9 Describe, in detail, the role of human ear in maintaining equilibrium 15



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M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

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 Draw a typical bacterial growth curve and label its various phases. Discuss the factors which determine the beginning and end of each phase. 15
- Q. 2 Discuss different types of bacteriological media. 15
- Q. 3 Write a detailed note on structure and composition of cell walls of bacteria 15
- Q. 4 Discuss the place of microorganisms in Whittaker's five kingdoms' classification scheme. 15
- Q. 5 What is meant by bacterial growth? Discuss ~~different modes of cell division~~ in microorganisms 15
- Q. 6 Enlist and briefly describe major kinds of microbial characteristics and indicate those that must be determined by examination of individual cells 15
- Q. 7 What is meant by pure culture? What are the advantages and disadvantages of the various techniques used for the isolation of microorganisms in pure cultures 15
- Q. 8 Give a comprehensive note on maintenance and preservation of pure cultures 15
- Q. 9 Discuss different physical conditions required for growth of microorganisms 15



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M.A./M.Sc. Part – II Supply 2020 & Annual – 2021

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.

1. Write in detail the about the function and importance of swim bladder.
2. Describe about the major feeding types of fishes.
3. Explain Zoological nomenclature of fishes.
4. What are different kinds and functions of teeth in major groups of fishes.
5. Describe about fish brain and cranial nerves.
6. Describe estuarine ecosystem with examples.
7. What is appendicular firm skeleton in fishes? Explain with diagrams.
8. Explain about social factors in fish ecology.
9. Write notes on followings:-
 - a- Fish gonads
 - b- Opportunity in ichthyology



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M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

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.

Q1	Give a general account and classification of order Lepidoptera.	15
Q2	Write note on any three of the following a) Bombycidae b) Apidae c) Coccinellidae d) culicidae	5x3
Q3	Write a detail note on different biological control agents.	15
Q4	Describe Diagnostic characters of any three families a) Thysanura b) Thysanoptera c) Mallophaga d) Tricoptera	5x3
Q5	Write notes on any two insects of economic importance.	15
Q6	a) Write a note on Economic Threshold b) Discuss insecticides mode of action	8 7
Q7	Describe different Pest Management Strategies.	15
Q8	Describe types of insecticides in detail.	15
Q9	Write notes on a) Economic importance of Diptera b) Environmental EIL c) Insecticide formulation	5x3



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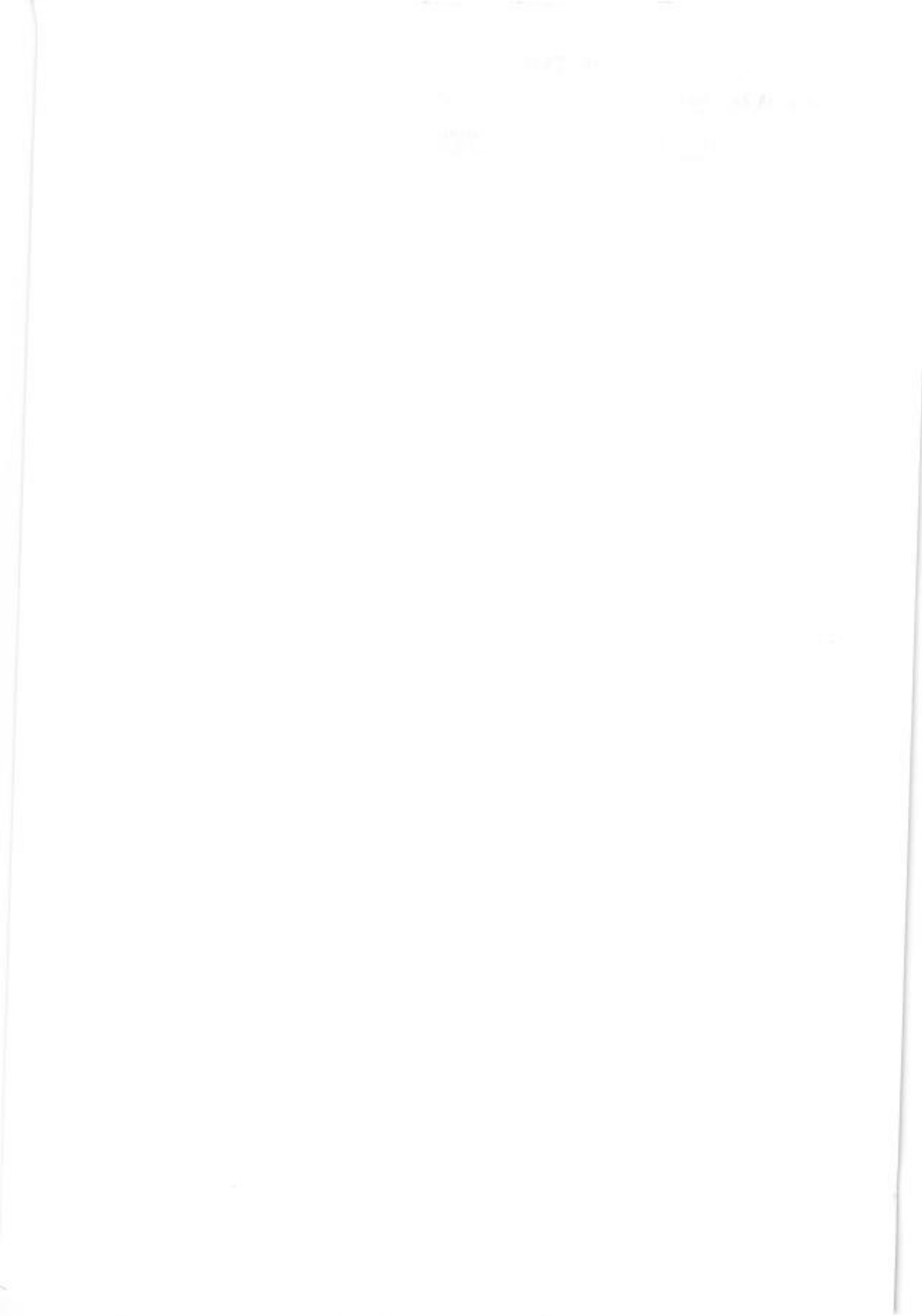
Roll No.

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	Write a comprehensive note on the composition of blood.	15
Q.2	Write a detailed note on coronary arteries and their functions.	15
Q.3	Explain briefly cardiac cycle.	15
Q.4	Describe the fine structure and functions of lymph node.	15
Q.5	Describe the process of acidosis and alkalosis in the body.	15
Q.6	Describe the structure of glomerulus basement membrane. What is function of the membrane in urine formation?	15
Q.7	Write a note on activation of T and B cells.	15
Q.8	Describe the structures and functions of olfactory mucosa.	15
Q.9	Write a note on the followings. <ul style="list-style-type: none">➤ Podocytes➤ Alveolar septum➤ Types of capillaries	15





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M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

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 What is meant by control of microorganism? Give a comprehensive note on control of microorganisms using high temperature and filtration. 15
- Q. 2 Write a note on humoral and cell mediated immunity. 15
- Q. 3 Give a comprehensive note on endotoxin. Also write difference between endotoxin and exotoxin. 15
- Q. 4 What is meant by potable water? Give a comprehensive note on Trickling filters bed. Also write briefly about role of radiation in wastewater treatment. 15
- Q. 5 Write about contribution of different scientists in development of chemotherapy and antibiotic. 15
- Q. 6 What is meant by Sanitation? Give a detail account on mode of action of phenol, sterilizing gases and heavy metals to control the microorganism. 15
- Q. 7 Write about interferon in detail with suitable sketches 15
- Q. 8 a) Discuss briefly Microbial population interactions 8
 b) Write the benefits of normal flora 7
- Q. 9 Write a note on 15
 a) Penicillin production
 b) Microbial spoilage of foods
 c) Genetic Engineering of microorganism



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M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

Subject: Zoology

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

Roll No.

Time: 3 Hrs. Marks: 75

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

- | | | |
|------|---|----|
| Q. 1 | What is meant by excretion? Discuss excretion in fishes. | 15 |
| Q. 2 | Explain the role of Pituitary and thyroid glands in fishes. | 15 |
| Q. 3 | Give an account on structure and function of heart in fishes | 15 |
| Q. 4 | Write a comprehensive note on natural breeding of fishes. | 15 |
| Q. 5 | What is meant by fish growth? Discuss factor affecting on fish growth.
Also discuss fish growth due to natural and artificial food | 15 |
| Q. 6 | Discuss role of swim bladder in fishes with suitable sketches | 15 |
| Q. 7 | Write a detailed note on Gonads in fishes. | 15 |
| Q. 8 | Give a comprehensive note on plant and animal origin feed ingredients. | 15 |
| Q. 9 | Write about gill in fishes with suitable sketches | 15 |



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M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

Paper: V-1 (Integrated Pest Management)

Roll No.

Time: 3 Hrs. Marks: 75

Subject: Zoology

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

Q1	Describe different ecological management practices to control pest population.	15
Q2	What is ecological Backlash? How can we manage it.	15
Q3	Describe factors that affect Economic Injury Level.	15
Q4	a) Discuss relationships between damage boundary and gain threshold b) Write a note on insecticide mode of action	7 8
Q5	Describe types of chemical insecticides and their mode of actions.	15
Q6	Write a note on various pest management strategies and tactics.	15
Q7.	Describe biological control in detail with suitable examples.	15
Q8	Describe types of insecticide Formulations in detail	15
Q9	Write note on : a) Crop Rotation b) Augmentation of Biocontrol Agents c) Sub-Economic Pests	5x3



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M.A./M.Sc. Part – II Supply 2020 & Annual – 2021

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 COLEOPTERA? [3, 12]

b). Write notes on the morphology & bionomics of any three families of order COLEOPTERA?

Q2. Give diagnostic features of order LEPIDOPTERA. Give economic importance of any three important families? [15]

Q3. Write note on the following: [15]

1. Order Thysanura
2. Order Siphunculata

Q4. Explain Biology and Lifecycle of any two pest of cotton crop? [15]

Q5. Write a detailed account on Pyrethroids? [15]

Q6. What are the attributes of the beneficial organisms? [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. Apidae
- b. Bombycidae
- c. Culicidae
- d. Coccinellidae
- e. Reduviidae

Q9. Write note on [15]

1. Economic Threshold
2. Economic Injury level



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M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

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 Abnormalities of Growth hormone secretion? 15
- Q. 2. Discuss, comprehensively, the role of GTP binding Protein in cell signaling? 15
- Q. 3. Describe, in detail, the causes and consequences of Type 2 Diabetes mellitus 15
- Q. 4. Discuss, comprehensively, the mechanism of action of insulin involving cell signaling by RTK? 15
- Q. 5. Give a detailed account of causes, consequences and treatment option of hyperadrenalism-cushing s' syndrome? 15
- Q. 6. Describe, in detail, the biological functions of testosterone? 15
- Q.7. Write a detailed account on causes, symptoms and treatment of hyperthyroidism? 15
- Q. 8. Write notes on the following:
A) Anorexia Nervosa 8
B) Cretinism 7
- Q. 9. Describe in detail, the causes and consequences of Rickets in children? 15



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M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

Subject: Zoology

Paper: V-12 (Animal Behaviour)

Roll No.

Time: 3 Hrs. Marks: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks. Support your answers with necessary illustrations.

- | | | |
|----|---|-----|
| Q1 | a) Discuss in detail, ecological and ornithological approaches of the study of animal behavior. | 10 |
| | b) Give a brief account on inking behavior of cephalopods | 5 |
| Q2 | a) Can genes control behavior? If yes, Support your answer with suitable example. If No, give logical reasoning | 10 |
| | b) Comprehensively narrate interaction between genes, environment and behavior. | 5 |
| Q3 | How do you know when to eat? Discuss decision making process in relation to maintaining eating behavior. | 15 |
| Q4 | Explain different kinds of biological rhythm? By what means, it can be controlled? | 15 |
| Q5 | Enlist various channels of communication, give a detail account on | |
| | a) Acoustic channel | 7.5 |
| | b) Electrical channel | 7.5 |
| Q6 | How Cray fish generate rapid escape response with the help of intermediate neurons | 15 |
| Q7 | Write a note on optimal foraging | 8 |
| | Discuss in detail, the factor effecting foraging behavior | 7 |
| Q8 | Define conflict. Discuss conflict of resources | 5 |
| | Explain familial conflict and its types | 10 |
| Q9 | Describe social organization in | |
| | Termites | 7.5 |
| | Honey bees | 7.5 |



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

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) Write about impact and their control of following organisms on fish 10
i) Amphibians ii) Reptiles iii) Birds
- b) Give an account on detrimental effects of chemicals and fertilizers on fishes. 5
- Q. 2 Discuss construction of fish hatchery with suitable sketches. 15
- Q. 3 Give a comprehensive note on common Freshwater aquatic weeds and their control 15
- Q. 4 Write in detail about management of fish farm. 15
- Q. 5 Discuss Fish harvesting and marketing in detail. 15
- Q. 6 Write a note on extensive and semi-culture in detail. 15
- Q. 7 Discuss stepwise hormonal induced breeding in major carps . 15
- Q. 8 Write about feeding adaptation in fishes in detail. 15
- Q. 9 Discuss varieties of organic and inorganic fertilizers for fish ponds, Dose of fertilizers and its uses. 15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

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 different types of bacteriological media. 15
- Q. 2 a- Write a note on importance and formation of bacterial capsules. 05
- b- Discuss major characteristics of microorganisms which are taken into account while characterizing and identifying them. 10
- Q. 3 Describe and make notes to the limitations of different methods used for quantitative measurements of bacterial growth. 15
- Q. 4 Give a detailed note on structure and composition of cell wall in bacteria 15
- Q. 5 a- Give grouping of bacteria with respect to their optimum pH. 05
- b- Discuss general methods of classifying bacteria. 10
- Q. 6 Describe structures internal to the cell wall of bacteria. 15
- Q. 7 Give a detailed account on contributions of Robert Koch in the development of medical microbiology. 15
- Q. 8 What is meant by pure culture? What are the advantages and disadvantages of the various techniques used for the isolation of microorganisms in pure cultures 15
- Q. 9 a) Describe the differences between various modes of cell division in bacteria. 7
- b) Discuss various phases of bacterial growth curve. 8

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Roll No.

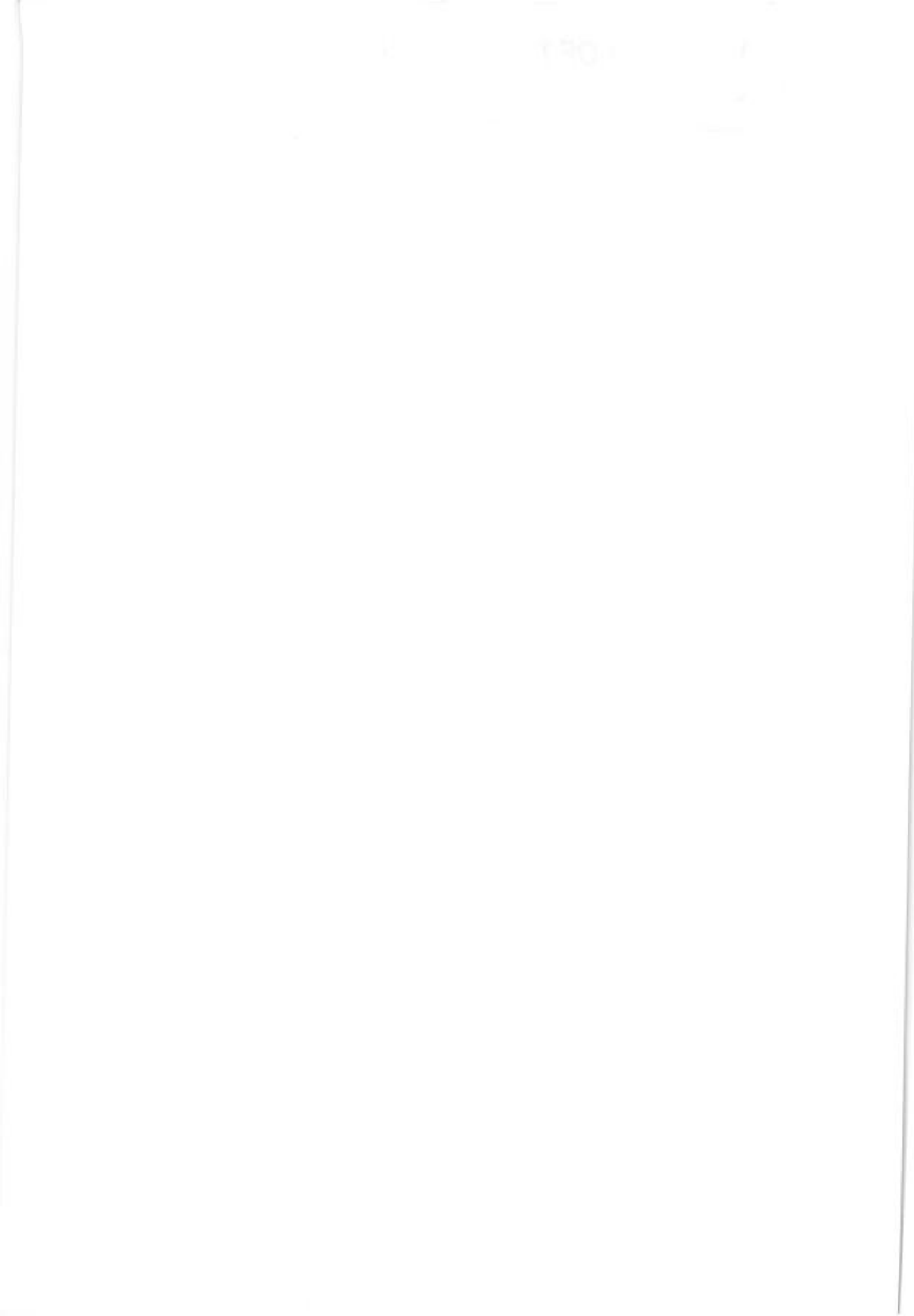
Time: 3 Hrs. Marks: 75

Subject: Zoology

Paper: V-20 (Mammalogy)

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

1	Give an account of: i) History of Mammalian Domestication ii) Communication in Mammals	7.5 x 2 = 15
2	Give a detailed account on: i) Territory and Territorial Behavior in mammals. ii) Rumination in mammals	7.5 x 2 = 15
3	Give the detailed discussion on the following Movement Patterns of Mammals. i) Arboreal ii) Fossorial iii) Leaping iv) Gliding v) Flying	3 x 5 = 15
4	Give the classification of Mammals on the basis of dietary patterns.	15 x 1 = 15
5	i) Discuss the general characters and classification of the order Primates. ii) Write a note on a) Insectivora b) Carnivora	7.5 x 2 = 15
6	Describe the Dispersal of following mammals: i) Gibbon ii) Bandicoot iii) European Mole iv) Opossum v) Asian Elephant	3 x 5 = 15
7	Explain the distinguishing characters of: i) Triconodonts ii) Docodonts	7.5 x 2 = 15
8	Write a detailed note on specialization of the MAMMALIAN TEETH.	15 x 1 = 15
9	Write a detailed note on: i) Hibernation in mammals ii) Aestivation in mammals iii) Echolocation in mammals	5 x 3 = 15





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M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

Subject: Zoology

Paper: V-22 (Vector Biology)

Roll No.

Time: 3 Hrs. Marks: 75

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

- Q1. Write a detailed note on the morphology of a mosquito along with labelled sketch? [15]
- Q2. a). Give an account of the life cycle of Horse fly? [8]
b). Explain Loiasis [7]
- Q3. What are different control strategies for the following [8,7]
a). Black fly
b). Tsetse fly
- Q4. Discuss life cycle and control practices for Blue bottles [15]
- Q5. Discuss medical importance and control of House fly? [15]
- Q6. What is Myiasis? Give detail of its different types [15]
- Q7. Explain morphology and control measures of black fly? [15]
- Q8. a). Give an account of the Life cycle sand fly? [8]
b). Explain Leishmaniasis? [7]
- Q9. a). Write a note on Blood feeding and the gonotrophic cycle in mosquitoes [12]
b). What are Arboviruses? [3]



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M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

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 DEVELOPMENT OF PLACENTA, PLACENTAL CIRCULATION AND ITS FUNCTIONS IN THE NORMAL HUMAN DEVELOPMENT?**
- Q. 2. WRITE AN ACCOUNT ON TERATOGENESIS INDUCED BY DRUGS**
- Q. 3. WRITE A COMPREHENSIVE NOTE ON PLACENTAL DEVELOPMENT AND ITS MAJOR ABNORMALITIES; ALSO DISCUSS THE ECTOPIC PREGNANCIES**
- Q. 4. DISCUSS THE VARIOUS KIND OF DEVELOPMENTAL ANOMALIES OF CENTRAL NERVOUS SYSTEM**
- Q. 5. DESCRIBE THE INDIFFERENT DEVELOPMENT OF HUMAN GONADS AND REPRODUCTIVE DUCT SYSTEM THEIR RELEVANT TRANSFORMATION IN TO THE TESTIS / OVARY AND THE MALE / FEMALE REPRODUCTIVE SYSTEM**
- Q. 6. GIVE A DETAILED ACCOUNT ON NEPHROGENESIS AND ALSO DISCUSS RENAL AGENESIS AND ECTOPIA IN HUMAN EMBRYOS**
- Q. 7. DESCRIBE HUMAN FEMALE REPRODUCTIVE CYCLE AND THE ASSOCIATED MECHANISM OF PREGNANCY WITH REFERENCE TO THE ROLE VARIOUS HORMONES INVOLVED**
- Q. 8. DESCRIBE THE EYE DEVELOPMENT IN HUMAN EMPHASIZING THE DIFFERENTIATION OF LENS AND RETINA**
- Q. 9. WRITE NOTES ON THE FOLLOWINGS:**
 - I. TERATOSPERMIA**
 - II. IMPLANTATION**
 - III. TOXOPLASMOSIS**



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M.A./M.Sc. Part – II Supply 2020 & Annual – 2021

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 Leukemia and Lymphoma? Describe various types of Leukemia and Lymphoma	15
Q. 2	What is telomerase? Describe the role of telomerase in limitless replication potential in cancer cells?	15
Q. 3	What are dietary carcinogen? Describe the molecular mechanism of synthesis of various dietary carcinogens?	15
Q. 4	a) What are cancer diagnostic markers? Write a note on Ki-67 and PCNA. b) What are oncogenes? Differentiate between Viral-Oncogenes and Cellular Oncogenes.	8 7
Q. 5	Describe regulation and role of STAT3 signaling pathway.	15
Q. 6	Describe TNM staging system of cancer	15
Q. 7	What are human papiloma viruses? What are high risk and low risk HPVs? Describe the mode of infection and mechanism of action of HPVs in vaginal and cervical cancer.	15
Q. 8	a) What are proteases? Describe different proteases involved in cancer invasion? b) Write a note on Warburg effect.	8 7
Q. 9	a) What are oncogenes? Describe the mechanism of RNA onco-viruses in tumorigenesis	15



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

Subject: Zoology

Paper: V-29 (Molecular Biology)

Roll No.

Time: 3 Hrs. Marks: 75

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

Q1:a)	Discuss in detail the Base excision and Nucleotide excision repair mechanism	8
b)	Describe various types of physical and chemical mutagens which cause damage to DNA structure.	7
Q2:a)	Explain with experiment that a nucleosome free DNA region is hypersensitive to DNase I.	7
b)	Describe the structures of a nucleosome and a 30-nm fiber.	8
Q 3:	Describe the essential features of a plasmid and a phage vector. What are the advantages and applications of plasmids and phage as cloning vectors?	15
Q4:a)	What are the general steps in the processing of a pre-mRNA into an mRNA? What is the role of the snRNPs and the spliceosome?	8
b)	Differentiate between the structure of ribosomes of prokaryotes and eukaryotes.	7
Q5:a)	What is genetic code? Discuss its salient features and explain what is meant by degeneracy of genetic code?	10
b)	Discuss the types and mode of action of topoisomerases.	05
Q 6:	Describe the process of transcription in eukaryotes	15
Q7:a)	What is the difference between a cDNA and a genomic DNA library? How would you use hybridization to screen a library for a specific gene?	8
b)	Explain the process of elongation in eukaryotic transcription.	7
Q 8	Describe the molecular events that occur at the <i>lac</i> operon when <i>E. coli</i> cells are shifted from a glucose-containing medium to a lactose-containing medium.	15
Q 9	Write notes on two of the following (a) Micro RNA and RNAi. (b) tRNA processing in eukaryotes. (c) <i>recA</i> -dependent bacterial homologous recombination (Holyday model)	7.5+7.5



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M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

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 the types and sources of aerosols.
2. Explain the characterization of bacteria with fluorescent In Situ hybridization flow cytometry
3. What is air pollution describe its causes, impacts and remedies.
4. How does air pollution affect the carbon cycle?
5. List some of the general measures of controlling indoor air pollution.
6. Give the sources and health effects of different indoor air pollutants in tabular form.
7. a. Write a note on removal and lifetimes of aerosol particles.
b. Write a note on dispersal of bio-aerosols in the atmosphere with the help of diagram.
8. a. Write a note on particle size, shape and density.
b. What are impactors? Explain with the help of diagram.
9. Define the following terms:
 - I. What is aerosol
 - II. What is dust
 - III. What is fog
 - IV. What is fume
 - V. What is haze
 - VI. What is mist
 - VII. What is particle
 - VIII. What is smog
 - IX. What is smoke
 - X. What is soot
 - XI. What is air pollution
 - XII. Acid rain
 - XIII. What is Beer Lambert Law
 - XIV. What is SMPS
 - XV. What is genotoxicity



UNIVERSITY OF THE PUNJAB

M.A./M.Sc. Part – II Supply – 2020 & Annual – 2021

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 Rodenticide
- 2 Incidence
- 3 Carrier
- 4 Infected individual
- 5 Susceptible
- 6 Infectious agent
- 7 Immune individual
- 8 Source of infection
- 9 Zoonosis
- 10 Insecticide
- 11 Quarantine
- 12 Pandemic
- 13 Virulence
- 14 Unapparent infection (asymptomatic infection)
- 15 Infectious disease

Question 2. Write details of disinfection and its types.

Question 3. Explain how transmission agents got spread (transmitted)?

Question 4. What is Suicide and its major types, causes and preventive measures?

Question 5. What strategies would work irrespective of socio-economic differences to empower people to be responsible for their health?

Question 6. What are cost effective interventions to combat environmental diseases?

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

- a) Mental, behavioural and neurological disorders
- b) Chronic obstructive pulmonary disease
- c) Interpersonal violence

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

- a) Dengue
- b) Tuberculosis
- c) Intestinal nematode infections

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

- a) Lymphatic filariasis
- b) Leishmaniasis
- c) Chagas disease