GENERIC ELECTIVE THEORY 1 (GET1)- ANIMAL DIVERSITY

2 Marks Questions -(Remembering and Understanding) [CO-1, CO-2]

1. Define locomotory organelles in Amoeba.
2. What is metagenesis in Obelia?
3. List the general characters of Porifera.
4. Name the adaptations of Ascaris lumbricoides to its parasitic mode of life.
5. What is metamerism?
6. Write two features of the water vascular system in Asteroidea.
7. Define osmoregulation in fishes.
8. What are the differences between poisonous and non-poisonous snakes?

3 Marks Questions-Applying and Analyzing [CO-3, CO-4]

1. Explain the locomotion mechanism in Paramecium.
2. Classify Cnidaria up to the class level with examples.
3. Discuss the canal system in Sycon.
4. How does respiration occur in Pila?
5. Classify Amphibia up to the subclass level with suitable examples.
6. Describe the feeding mechanism in Amphioxus.
7. Write short notes on metamorphosis in Lepidoptera.

4 Marks Questions (Applying, Analyzing, and Evaluating) [CO-3, CO-4, CO-5]

1. Differentiate between the general characters of Protozoa and Porifera.
2. Explain the life history of Taenia solium.
3. Analyze the biting mechanism of snakes.
4. Compare and contrast hair, horn, and antler in mammals.
5. Describe the structure and function of the eye in a cockroach.
6. Illustrate the classification of Reptilia up to subclasses with examples.

5 Marks Questions (Analyzing, Evaluating, and Creating) [CO-4, CO-5, CO-6]

1. Discuss the classification and evolutionary significance of Agnatha.
2. Explain flight adaptations in birds with suitable examples.
3. Describe the water vascular system in Asteroidea with a neat diagram.
4. Analyze the role of parental care in Amphibia with examples.
5. Classify Protochordata and describe the pharynx and its feeding mechanism in Amphioxus.
6. Write a detailed note on osmoregulation in marine and freshwater fishes.
7. Explain metamerism in Annelida with reference to its evolutionary importance.

GENERIC ELECTIVE THEORY 3 (GET3)- PHYSIOLOGY AND BIOCHEMISTRY

2 Marks Questions -(Remembering and understanding) [CO-1, CO-2]

1. Define resting membrane potential.
2. What is the difference between myelinated and non-myelinated nerve fibers?
3. Name the major steps involved in glycolysis.
4. What are transamination and deamination?
5. List two functions of the pituitary gland.
6. What is the composition of blood?
7. Define the cardiac cycle.
8. State the function of the counter-current mechanism in the nephron.
9. Name two enzymes involved in the digestion of proteins.
10. What are the hormonal changes during the menstrual cycle?

3 Marks Questions (15 Questions)-Applying and Analyzing [CO-3, CO-4]

1. Explain the propagation of an action potential in myelinated nerve fibers.
2. Describe the molecular basis of muscle contraction.
3. Outline the physiology of digestion of carbohydrates in the alimentary canal.
4. Illustrate the transport of oxygen in the blood.
5. Discuss the structure and function of the nephron.
6. Explain the hormonal control of spermatogenesis.
7. Describe the role of the thyroid gland in metabolism.
8. Compare glycolysis and the Kreb's cycle in carbohydrate metabolism.

4 Marks Questions (Applying, Analyzing, and Evaluating) [CO-3, CO-4, CO-5]

1. Compare the structure of myelinated and non-myelinated nerve fibers and their conduction speed.
2. Analyze the ultra-structure of skeletal muscle and its significance in muscle contraction.
3. Discuss the absorption of lipids in the digestive system.
4. Explain the origin and conduction of the cardiac impulse in the heart.
5. Evaluate the role of the counter-current mechanism in urine concentration.
6. Differentiate between the hormonal control mechanisms of male and female reproduction.
7. Describe the steps involved in beta oxidation of palmitic acid.
8. Explain the factors affecting enzyme action with examples.

5 Marks Questions (Analyzing, Evaluating, and Creating) [CO-4, CO-5, CO-6]

1. Describe the origin of an action potential and its propagation along nerve fibers, comparing myelinated and non-myelinated neurons.
2. Illustrate the cardiac cycle, explaining its phases and their significance.
3. Discuss the hormonal regulation of the menstrual cycle with detailed histology of the ovary.
4. Explain the Kreb's cycle with a diagram, highlighting its role in cellular respiration.
5. Describe the process of beta oxidation of linoleic acid and its biochemical significance.
6. Analyze the role of the electron transport chain in energy production.
7. Compare the structure and functions of the pituitary and adrenal glands.
8. Write a detailed note on enzyme inhibition and its types with examples.

Skill Enhancement courses-A (General) (SEC-A [G])-Apiculture

2 Marks Questions -(Remembering and understanding) [CO-1, CO-2]

1. Define apiculture.
2. List the major species of honey bees used in apiculture.
3. What is the social organization of a honey bee colony?
4. Name the parts of a Langstroth beehive.
5. Define bee pasturage.
6. Mention two common bee diseases.
7. List two enemies of honey bees.
8. Name two products of the apiculture industry.
9. What is the role of propolis in a beehive?
10. Define cross-pollination in the context of apiculture.

3 Marks Questions (15 Questions)-Applying and Analyzing [CO-3, CO-4]

1. Explain the role of the queen bee in a honey bee colony.
2. Compare Newton and Langstroth beehives.
3. Describe the process of artificial bee rearing in an apiary.
4. Discuss the significance of selecting appropriate bee species for apiculture.
5. Explain how bee pasturage impacts honey production.
6. Illustrate the steps involved in indigenous honey extraction.
7. Analyze the economic importance of beeswax.
8. Discuss the preventive measures for one common bee disease.
9. Describe the benefits of using artificial beehives in horticultural gardens.
10. Explain the role of pollen as a product of apiculture.

4 Marks Questions (Applying, Analyzing, and Evaluating) [CO-3, CO-4, CO-5]

1. Classify honey bees up to the species level and describe their characteristics.
2. Discuss the social organization of a honey bee colony and the roles of its members.
3. Evaluate the advantages of modern bee-keeping equipment over traditional methods.
4. Describe the modern method of honey extraction and its advantages over indigenous methods.
5. Explain the control measures for Varroa mites in beekeeping.
6. Analyze the factors affecting the choice of bee species for apiculture in different regions.
7. Discuss the significance of bee pasturage in sustainable apiculture.
8. Compare the economic importance of honey and beeswax.
9. Describe the recent efforts in promoting apiculture as an entrepreneurial venture.
10. Explain the role of apiculture in improving cross-pollination and horticultural yield.

5 Marks Questions (Analyzing, Evaluating, and Creating) [CO-4, CO-5, CO-6]

1. Illustrate the classification and detailed biology of honey bees.
2. Discuss the structure and functioning of a Langstroth box with a neat diagram.

3. Explain the modern techniques of artificial bee rearing and their impact on honey production.
4. Evaluate the economic significance of apiculture products such as honey, beeswax, and propolis.
5. Discuss the methods for preventing and controlling diseases and enemies of honey bees.
6. Analyze the role of modern equipment in enhancing the efficiency of beekeeping.
7. Compare indigenous and modern methods of honey extraction in terms of efficiency and quality.
8. Design a plan for starting an apiculture-based entrepreneurial venture.
9. Discuss the role of artificial beehives in enhancing cross-pollination in horticultural gardens, providing specific examples.
10. Write a comprehensive note on the challenges and future prospects of the apiculture industry.

Discipline specific courses [DSE-A (G)]-Applied Zoology

2 Marks Questions -(Remembering and understanding) [CO-1, CO-2]

1. Define host and parasite.
2. Name two types of hosts with examples.
3. List the modes of transmission of tuberculosis.
4. What is the causative agent of typhoid?
5. Write the pathogenic effects of *Entamoeba histolytica*.
6. Name the intermediate host of *Plasmodium vivax*.
7. What is the economic damage caused by *Heliocoverpa armigera*?
8. Name two insects of medical importance.
9. Define artificial insemination in cattle.
10. Mention two principles of poultry breeding.

3 Marks Questions (15 Questions)-Applying and Analyzing [CO-3, CO-4]

11. Explain the difference between endoparasites and ectoparasites with examples.
12. Discuss the preventive measures for tuberculosis.
13. Describe the life cycle of *Entamoeba histolytica*.
14. Write a short note on the pathogenicity of *Trypanosoma gambiense*.
15. Explain the damage caused by *Pyrilla perpusilla* and its control measures.
16. Discuss the medical importance of *Anopheles* mosquitoes.
17. Outline the process of synchronization of estrus in cattle.
18. Explain the role of genetic improvement in aquaculture.
19. Describe the transportation of fish seeds in aquaculture.
20. Discuss the management of breeding stock in poultry farming.

4 Marks Questions (Applying, Analyzing, and Evaluating) [CO-3, CO-4, CO-5]

21. Compare the different types of host-parasite relationships.
22. Analyze the modes of transmission and control measures of typhoid.
23. Describe the life cycle and pathogenicity of *Plasmodium vivax*.
24. Explain the economic importance of controlling *Heliocoverpa armigera*.
25. Evaluate the impact of *Tribolium casteneum* on stored grains and its control.
26. Discuss the preservation methods of eggs in poultry farming.
27. Explain the importance of induced breeding in fish technology.
28. Evaluate the significance of early puberty induction in cattle.
29. Compare the biology and control methods of *Sytophilus oryzae* and *Tribolium casteneum*.
30. Analyze the pathogenicity of *Wuchereria bancrofti* in relation to its life cycle.

5 Marks Questions (Analyzing, Evaluating, and Creating) [CO-4, CO-5, CO-6]

31. Classify types of hosts and parasites and discuss their interdependence with examples.
32. Describe the epidemiology, transmission, prevention, and control of tuberculosis.
33. Write a detailed note on the life history of *Trypanosoma gambiense* and its pathogenicity.
34. Explain the life history and pathogenicity of *Alcylostoma duodenale*.
35. Discuss the biology, damage caused, and control measures of *Heliocoverpa armigera*.

36. Explain the medical importance and control strategies for *Anopheles* mosquitoes.
37. Illustrate the process of artificial insemination and its advantages in animal husbandry.
38. Write a comprehensive note on the principles of poultry breeding and management.
39. Discuss the role of genetic improvements and induced breeding in the aquaculture industry.
40. Evaluate the challenges and future prospects of the fish seed transportation process in aquaculture.

GENERIC ELECTIVE THEORY 2 (GET-2)- Comparative Anatomy & Developmental Biology

2 Marks Questions -(Remembering and understanding) [CO-1, CO-2]

1. Name two types of glands found in the integument of birds.
2. What is the function of sebaceous glands in mammals?
3. Define dentition and give an example of homodont dentition.
4. List the different types of respiratory structures in vertebrates.
5. What are swim bladders? State their function.
6. Define aortic arches.
7. What are the three types of kidneys in vertebrates during evolution?
8. Name the ducts involved in the evolution of the urino-genital system.
9. What is spermatogenesis?
10. Define morphogenetic movements and give one example.

3 Marks Questions (15 Questions)-Applying and Analyzing [CO-3, CO-4]

11. Explain the significance of preen glands in birds.
12. Compare stomach morphology in ruminants and carnivores.
13. Describe the role of air sacs in the respiratory system of birds.
14. Outline the evolutionary changes in the heart from fish to mammals.
15. Explain the process of oogenesis in mammals.
16. Write a short note on the structure of a mature frog egg.
17. Discuss the patterns of cleavage in early embryonic development.
18. Describe the hormonal regulation of metamorphosis in frogs.
19. Explain the types of placenta based on the degree of implantation.
20. Analyze the importance of germ layers in organ formation.

4 Marks Questions (Applying, Analyzing, and Evaluating) [CO-3, CO-4, CO-5]

21. Discuss the integumentary derivatives in mammals with special reference to glands.
22. Compare and contrast gills and lungs as respiratory structures.
23. Explain the structure and function of a swim bladder in fishes.
24. Describe the evolutionary changes in aortic arches in vertebrates.
25. Illustrate the succession of kidneys during vertebrate evolution.
26. Evaluate the structural differences between spermatogenesis and oogenesis.
27. Write an account on the fertilization process in sea urchins.
28. Explain the fate map of the frog blastula up to gastrula formation.
29. Discuss the role of morphogenetic movements during gastrulation.
30. Analyze the types and functions of placentas in mammals.

5 Marks Questions (Analyzing, Evaluating, and Creating) [CO-4, CO-5, CO-6]

31. Illustrate and describe the derivatives of the integument in birds and mammals.
32. Compare dentition in herbivores, carnivores, and omnivores, highlighting their adaptations.
33. Explain the evolution of the heart in vertebrates with a diagram.
34. Write a detailed note on the evolution of urino-genital ducts in vertebrates.
35. Describe the process of spermatogenesis and oogenesis with respect to hormonal regulation.

36. Discuss the patterns of cleavage and the formation of the gastrula in frog development.
37. Analyze the fate of germ layers and their contribution to organogenesis.
38. Explain the types of morphogenetic movements with examples.
39. Discuss the metamorphic events in the frog life cycle and the hormonal control involved.
40. Write a comprehensive account on the types and functions of placentas in mammals.

GENERIC ELECTIVE THEORY 4 (GET-4)- Genetics & Evolutionary Biology

2 Marks Questions -(Remembering and understanding) [CO-1, CO-2]

1. State Mendel's principles of inheritance.
2. Define codominance with an example.
3. What is meant by multiple alleles? Give an example.
4. Name the types of mutations under chromosomal mutations.
5. What is meant by complete linkage?
6. Define recombination frequency.
7. What is the significance of the Holliday model in genetics?
8. State the genic balance theory of sex determination.
9. Define aneuploidy with an example.
10. Mention any two postulates of Darwin's theory of natural selection.

3 Marks Questions (15 Questions)-Applying and Analyzing [CO-3, CO-4]

11. Explain the concept of incomplete dominance with an example.
12. Discuss the inheritance of the white eye locus in *Drosophila*.
13. Compare lethal alleles with multiple alleles using examples.
14. Describe the difference between induced mutation and gene mutation with examples.
15. Explain the concept of dosage compensation in *Drosophila*.
16. Write a short note on the chemical origin of life.
17. Compare Lamarckism and Darwinism.
18. Outline the process of crossing over during meiosis.
19. Discuss the isolating mechanisms in the process of speciation.
20. Explain the concept of sympatric speciation.

4 Marks Questions (Applying, Analyzing, and Evaluating) [CO-3, CO-4, CO-5]

21. Explain the chromosomal theory of inheritance with a suitable diagram.
22. Discuss the genetic basis of thalassemia in humans as an example of sex-linked inheritance.
23. Evaluate the significance of recombination frequency as a measure of linkage intensity.
24. Describe the types of chromosomal mutations with examples.
25. Compare and contrast complete and incomplete linkage.
26. Discuss the Holliday model for homologous recombination.
27. Explain the role of genic balance in determining sex in *Drosophila*.
28. Write an account on Darwinism and its significance in evolutionary biology.
29. Describe the isolating mechanisms that lead to reproductive isolation.
30. Compare the processes of sympatric and allopatric speciation with examples.

5 Marks Questions (Analyzing, Evaluating, and Creating) [CO-4, CO-5, CO-6]

31. Illustrate and explain the principles of Mendelian inheritance.
32. Describe the inheritance pattern of the white eye locus in *Drosophila* and its genetic significance.

33. Discuss the molecular mechanism of crossing over and its importance in genetic diversity.
34. Explain the concept of multiple alleles using the example of blood group inheritance in humans.
35. Write a detailed note on the types of chromosomal mutations and their consequences.
36. Analyze the chemical origin of life and its experimental evidence (e.g., Miller-Urey experiment).
37. Compare and evaluate Lamarckism, Darwinism, and Neo-Darwinism in the context of modern evolutionary biology.
38. Discuss the process of natural selection and its role in evolutionary changes.
39. Explain allopatric and parapatric speciation with examples, and discuss their evolutionary implications.
40. Write a comprehensive note on genic balance theory and dosage compensation in *Drosophila*.

Skill Enhancement courses-B (General) (SEC-B [G])- Aquarium Fish Keeping

2 Marks Questions -(Remembering and understanding) [CO-1, CO-2]

1. Define the scope of the aquarium fish industry as a cottage industry.
2. Name two exotic and two endemic aquarium fish species.
3. List two common characters of freshwater aquarium fishes.
4. Mention any two examples of marine aquarium fishes.
5. What is sexual dimorphism in aquarium fishes?
6. Name two live fish feed organisms.
7. What are formulated fish feeds?
8. Define live fish transportation.
9. Mention two techniques used in packing aquarium fishes for transport.
10. What is the significance of maintaining water quality in aquariums?

3 Marks Questions (15 Questions)-Applying and Analyzing [CO-3, CO-4]

11. Explain the potential of the aquarium fish industry as a source of livelihood.
12. Differentiate between exotic and endemic species with examples.
13. Write a short note on the sexual dimorphism in guppy and molly fishes.
14. Describe the biology of angel fish and its importance in aquariums.
15. Explain the role of live fish feed organisms in fish nutrition.
16. Discuss the advantages of using formulated fish feeds.
17. Outline the steps involved in handling aquarium fishes during transport.
18. Explain the importance of packing techniques in live fish transportation.
19. Describe the daily maintenance requirements of a home aquarium.
20. Analyze the importance of budgeting when setting up an aquarium fish farm.

4 Marks Questions (Applying, Analyzing, and Evaluating) [CO-3, CO-4, CO-5]

21. Discuss the scope and challenges of the aquarium fish industry as a cottage industry.
22. Compare the common characters of freshwater and marine aquarium fishes.
23. Write an account on sexual dimorphism in swordtail and butterfly fish.
24. Describe the biology and aquarium care of anemone fish.
25. Explain the preparation and composition of formulated fish feeds.
26. Discuss the importance of live feed organisms in the diet of aquarium fishes.
27. Evaluate the different techniques used for live fish packing and their effectiveness.
28. Write a note on the general guidelines for transporting live fish safely.
29. Discuss the steps involved in setting up an aquarium fish farm as a cottage industry.
30. Analyze the budgetary considerations for maintaining a large-scale aquarium.

5 Marks Questions (Analyzing, Evaluating, and Creating) [CO-4, CO-5, CO-6]

31. Illustrate and explain the potential scope of the aquarium fish industry as a cottage industry.
32. Compare and contrast exotic and endemic aquarium fish species with examples.

33. Describe the biology, sexual dimorphism, and aquarium care of goldfish and blue morph.
34. Discuss the preparation of formulated fish feeds and their advantages over live feeds.
35. Write a detailed note on the handling, packing, and forwarding techniques in live fish transportation.
36. Explain the biology and maintenance requirements of butterfly fish in marine aquariums.
37. Analyze the challenges and solutions in maintaining a balanced diet for aquarium fishes.
38. Discuss the general maintenance practices for a community aquarium and their importance.
39. Write a comprehensive note on the budget planning and setup of an aquarium fish farm.
40. Evaluate the role of live fish transport in the global aquarium industry and suggest improvements.

DSE-B -Ecology& Wild life Biology

2 Marks Questions -(Remembering and understanding) [CO-1, CO-2]

1. Define autecology and synecology.
2. What are the levels of organization in ecology?
3. State the law of limiting factors.
4. What is the biosphere?
5. Define fecundity tables and their significance in population studies.
6. What are survivorship curves?
7. Differentiate between dispersal and dispersion in populations.
8. What is an ecotone?
9. Name two types of ecological pyramids.
10. Define the edge effect with an example.

3 Marks Questions (15 Questions)-Applying and Analyzing [CO-3, CO-4]

11. Explain the concept of density-dependent factors in population regulation.
12. Write a short note on geometric and logistic growth patterns in populations.
13. Discuss the characteristics of a community with examples.
14. Compare detritus and grazing food chains.
15. Explain the concept of energy flow through an ecosystem.
16. Describe the importance of ecological pyramids in understanding ecosystems.
17. Write a short note on the significance of tiger reserves in India.
18. Differentiate between in-situ and ex-situ conservation.
19. Discuss the management challenges in tiger reserves.
20. Explain the edge effect and its significance in community ecology.

4 Marks Questions (Applying, Analyzing, and Evaluating) [CO-3, CO-4, CO-5]

21. Discuss the importance of the biosphere in ecological studies.
22. Compare density-independent and density-dependent factors in population regulation.
23. Write an account of species diversity and its role in community stability.
24. Explain vertical stratification in a community with examples.
25. Describe Y-shaped food chains and their significance in ecosystems.
26. Analyze the energy flow model in an ecosystem using a diagram.
27. Discuss the challenges in maintaining tiger populations in India.
28. Write a note on national parks and sanctuaries as tools for wildlife conservation.
29. Explain the concept of ecological efficiency and its role in energy transfer.
30. Describe the structure and function of a terrestrial ecosystem.

5 Marks Questions (Analyzing, Evaluating, and Creating) [CO-4, CO-5, CO-6]

31. Illustrate and explain the levels of ecological organization with examples.
32. Discuss the laws of limiting factors and their relevance to ecological studies.
33. Explain the use of life and fecundity tables in population ecology.
34. Analyze the differences in exponential and logistic growth patterns with equations and graphs.
35. Discuss the significance of ecotones and edge effects in maintaining biodiversity.

36. Write a detailed note on detritus and grazing food chains with examples.
37. Explain the concept of food webs and their importance in ecosystem stability.
38. Discuss the necessity of wildlife conservation and compare in-situ and ex-situ methods.
39. Write a comprehensive account of tiger conservation efforts in India, focusing on tiger reserves and challenges.
40. Analyze the types of ecosystems with detailed examples of aquatic and terrestrial ecosystems.