General Instructions

- Total number of pages should never exceed 10 and not less than 5.
- Put all your answers clearly and in readable form.
- Any plagiarism from anybody would result in **INCOMPLETE**
- Submit on time

Group I.

A. List the major views of modern classification and what are the major aspects that modern classification relays on.

B. Explain biogeochemical cycle and discuss in detail its function on energy transfer.

C. List two adaptations of amphibians, and briefly describe why each is important for life on land. Why does amphibian reproduction require a moist environment?

D. Discuss in detail about the difference and the relations of bryophytes, pteridophytes and spermatophytes.

E. What are immunological disorders? Give specific examples discuss them in detail.

F. Compare and contrast the basic characteristics and advancement of vertebrate and invertebrate animals taking account their survival and adaptability of each group over the other.

Group II.

A. What does the term taxonomy refer to?

B. Write the major taxon of the hierarchy from top to down.

C. Discuss and illustrate the trophic structures and energy flow in the ecosystems.

D. Explain the possible justification for the success of the Arthropoda (insects, crustaceans, spiders, etc.)?

E. What is the difference between gram positive and gram-negative bacteria? Explain the specific characteristics used to distinguish them. What is the importance of biochemical test in isolation and characterization of both bacteria?
F. Describe application of biology in different areas such as medicine, engineering, agriculture and industry.

Group III.

A. Write the major contribution of Carolus Linnaeus for the field of taxonomy?

B. Distinguish Nitrification, Ammonification and Denitrification by considering its role in providing the limiting nutrients.

C. Discuss in detail the three categories of microorganisms based on their ***pathogenicity*** by giving specific examples.

D. Why angiosperms are the most abundant and advanced groups of plants?
E. What is the difference between deuterostome and protostome embryonic development of animals?
F. Elaborate the basic characteristics and advancement of the organism that belong to Acoelomate, pseudocoelomate and coelomate as well as list down organism that belong to each group.

Group IV.

A. List 3 rules that should be followed during writing Binomial Nomenclature of organisms with hand.
B. Write the three domains of life.

C. Why the pyramid of numbers is inverted in parasitic food chain as compared to the other pyramids?

D. Distinguish the three groups of invertebrates with their basic characteristic advancement and other related feature of roundworms, the Flukes and flatworms
E. Mammals and birds have very different methods of reproduction, but both are able to reproduce on land. Explain why amniotes do not need to return to water to reproduce
F. Assume you are a biologist employed in one of the health bureaus in your local village. The bureau has assigned a research committee to study the prevalence of different diseases which are common on the residents. If you are requested to be a member of that committee and categorize the infectious diseases into different classes by occurrence, what would be the different classes of diseases and explain them in detail by giving specific examples.

Group V.

A. List the major concern of taxonomy?

B. Suppose you are a biologist employed in a National Fisheries and Other Aquatic Life Research Center. The research center is built beside riverbank, thus flood containing industrial wastes, oils pills, fertilizers and sewage enter the water body resulting in rapid growth of plankton. This promotes hypoxia, and massive kill of aquatic live including fish as well as booming **CO_2** pollution to the residents. ***So, what do you advise as a biologist to trigger the problem?***

C. What are the advantages of having an endoskeleton instead of an exoskeleton? Are there any disadvantages? Why?
D. Compare the basic structure and function of the two basic body plans.: polyp and medussa in Cnidaria.
E. What are radially symmetrical animals? Support your answer with

examples.

F. Discuss the differences among the different development and stages of disease.