

## **BIODIVERSITY & CONCEPTS OF CLASSIFICATION**

1. a) Distinguish the following terms giving examples in each case.
  - (i) natural classification and artificial classification. (02marks)
  - (ii) phylogenetic and phenetic classification. (02marks)
  - (iii) analogy and homology. (03marks)b) Explain the concepts of taxonomy. (10marks)  
c) State the importance of systematics of organisms. (03marks)
2. a) Describe the structure of a bacteriophage. (03marks)  
b) Discuss the life cycle of any named retrovirus. (07marks)  
c) Why are viruses considered
  - (i) living things. (02marks)
  - (ii) non-living things. (03marks)d) State the economic importance of viruses. (10marks)
3. a) Explain the distribution of prokaryotes in nature. (05marks)  
b) Giving examples how are bacteria classified basing on;
  - (i) mode of nutrition. (04marks)
  - (ii) cell shape. (03marks)c) Discuss the role of bacteria in nature. (08marks)
4. a) Give structural characteristics that the members of the Kingdom protocista share with those of:
  - (i) fungi (02marks)
  - (ii) prokaryotes (01mark)
  - (iii) planting (01mark)
  - (iv) Animalia. (02marks)b) Give four reasons why fungi are placed in a separate Kingdom from plants. (02marks)  
c) Use external or observable features to construct a dichotomous key between the following groups of organisms.
  - (i) plants, fungi, animals, protocists, prokaryotes. (04marks)
  - (ii) amphibians, fish, reptiles, mammals, birds. (04marks)
  - (iii) insects, crustaceans, arachnids, myriapods, chilopods. (04marks)
5. a) Stating relevant examples, describe the structure of fungi. (06marks)  
b) Discuss economic importance of fungi to other organisms. (10marks)  
c) Suggest how the effect of harmful fungi can be prevented. (04marks)

6. a) With examples, describe fully the meaning of the following terms used in zoology.
- (i) metameric segmentation. (02marks)
  - (ii) coelom. (04marks)
  - (iii) cephalization. (03marks)
  - (iv) symmetry. (05marks)
- b) Explain the advantages and disadvantages of coelom in animals. (06marks)
7. a) Discuss the divisions of plant kingdom giving examples in each case. (06marks)
- b) State a reason why some plants are described as lower and higher plants. (03marks)
- c) Explain the life cycle of a named lower plant. (06marks)
- d) How are higher plants evolved to be suited than lower plants? (05marks)
8. a) State the evolutionary significance of the following processes in animals
- (i) cephalization (03marks)
  - (ii) symmetry. (04marks)
- b) Explain the disadvantages of organisms or animals with a;
- (i) bilateral symmetry. (02marks)
  - (ii) asymmetry. (02marks)
  - (iii) radial symmetry. (02marks)
- c) Discuss the contribution of annelids in soil and nature. (07marks)
9. a) Compare the structural components of monocots and dicots. (10marks)
- b) Describe the contribution of;
- (i) plants to insects. (04marks)
  - (ii) insects to plants. (03marks)
- c) How are monocots adapted to survive in their habitats? (03marks)
10. a) Explain all the major features of chordates. (05marks)
- b) How are vertebrates able to utilize a variety of habitats? (10marks)
- c) State and explain the old dance over everywhere. (05marks)

**END**

## **HISTOLOGY – TISSUES**

1. a) State two major differences between granulocytes and agranulocytes.(02mks)  
b) Explain the role played by all types of white blood cells in mammals.(10mks)  
c) How are white blood cells adapted to perform their functions? (08marks)
  
2. a) Describe the structure of a red blood cell. (08marks)  
b) Explain the difference in the number of red blood cells in animals at different altitudes. (04marks)  
c) Explain how the red blood cells increase:  
(i) surface area. (04marks)  
(ii) rate of diffusion during their function. (04marks)
  
3. a) Blood is connective tissue. Explain. (05marks)  
b) State the role of different plasma components in the body. (10marks)  
c) Explain the importance of blood in the body. (05marks)
  
4. a) State the location of areolar tissue. (02marks)  
b) Discuss the structure of areolar tissue. (08marks)  
c) How is the structure of areolar tissue suited to its function? (10marks)
  
5. a) Compare adipose tissue and fibrous tissue. (06marks)  
b) How is adipose tissue important in different vertebrates? (10marks)  
c) Mention the distribution and function of fibrous tissue in the human body. (04marks)
  
6. a) Giving 6 examples in different organisms, explain the term effector. (04marks)  
b) Discuss the importance of the above effectors organisms that possess them. (06marks)  
c) Explain the effect of stimulation of the above effectors in the organisms. (10marks)
  
7. a) Explain the meaning of the following terms used in skeletal muscles. (07mks)  
(i) slow twitch                      (ii) single twitch                      (iii) fast twitch  
(iv) fatigue                              (v) tetanus                              (vi)refractory period

(vii) All or nothing law

- b) Describe the fine structure of a myofilament. (06marks)
- c) How is the skeletal muscle adapted to its function? (07marks)

8. a) Distinguish between cartilage and bone. (04marks)
- b) Explain how a bone is formed from cartilage. (05marks)
  - c) Describe the internal structure of a bone. (05marks)
  - d) How are bones able to perform their functions? (06marks)

9. Discuss the distribution and function of epithelial tissue in mammals. (20marks)

10. a) Compare the structure and function of xylem and phloem tissues. (08marks)
- b) How are the following tissues suited to perform their functions
    - (i) Xylem tissue. (05marks)
    - (ii) Phloem tissue. (07marks)

11. a) Describe the structure of parenchyma tissue. (05marks)
- b) Apart from storage, State other functions of parenchyma tissue in plants. (06marks)
  - c) How is the tissue suited to perform the functions stated in b) above?(09marks)

12. a) Briefly describe the structure of cells that make up the mechanical tissue. (10marks)
- b) Indicate the distribution of mechanical tissue in plants. (04marks)
  - c) Mention the general functions of mechanical tissue in plants. (06marks)

13. a) Compare the structure of sensory neuron to that of motor neuron. (10marks)
- b) How are neurons suited to perform their functions? (10marks)

**END**