

Note: Write to-the-point and specific answers. Wherever possible, draw representative diagrams to support your answer. Underline key words/phrases in your answer. Don't mix questions of the two parts, i.e. A & B.

- Once you complete this part, submit the answer sheet to the invigilator and collect the open book paper.

-Part A- [Six questions totaling 40 marks]

1. Your friend comes across a different looking organism, which are abundant in number in the vicinity. Your friend manages to conduct a cursory examination to watch the habitat, locomotion and feeding habits of the organism, but wants to know more about classification of the organism. If you were to help your friend, considering you have access to laboratory resources, what molecular approaches will you imply to identify: a) classification of new organism, b) evolutionary lineage. Make a flow chart listing the steps involved in a and b. [4+4=8M]

2. Based on distinct feature of possessing body cavity or not, what are the major divisions of the animals? While mentioning these divisions, please describe at least two distinguishing features of each with representative examples. [5M]

3. Explain why eyes are considered as an example of convergent evolution. [5M]

4. Identify and write a note including properties of specific organisms, causing: [3X3=9M]

a) Red Tides b) sleeping sickness c) Malaria

5. How is homeosis different from heterochrony? Explain with the help of specific examples. [8M]

6. Comment on a *diploblastic* organism covered in class, in terms of characteristic features of body shape, and organ systems. [5M]

-Part B- [Four questions totaling 20 marks]

7. Discuss briefly the different incentives, challenges and adaptations in plants during evolution. Give your answer point-wise and in a tabular format. [5M]

8. What are the five assumptions of Hardy-Weinberg equilibrium? Discuss briefly the consequences when none of the five assumptions are met. Write your answer for each of the five cases. [5M]

9. Mention briefly any five major objections that critics raise to the teaching of Darwinian evolution along with the scientists' response in each case. [5M]

10. Draw a cladogram depicting the evolutionary relationships among the mentioned species (and humans) according to their gene or protein percentage similarity in the GAPDH (glyceraldehyde-3-phosphate dehydrogenase) enzyme (given in the table). *Also mention why the protein percentage similarity is higher than the gene percentage similarity in each case.* [3+2= 5M]

Table: Percentage similarity of GAPDH

Species	Gene Percentage Similarity with humans (%)	Protein Percentage Similarity with humans (%)
Chimpanzee	99.6	100
Dog	91.3	95.2
Roundworm	68.2	74.3
Fruitfly	72.4	76.7