

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. SIXTH SEMESTER EXAMINATION, MAY 2025

THIRD YEAR [BATCH 2022-25]

ZOOLOGY (HONOURS)

Paper : CC 13

Date : 14/05/2025

Time : 11 am – 1 pm

Full Marks : 50

1. Answer **any five** questions: [5×2]
- How did the change in moth coloration in industrial melanism (e.g., **peppered moths** in England) demonstrate directional selection?
 - Which zoogeographical realm is known 'Continent of Birds' and why?
 - What is hot dilute soup?
 - How many unrooted trees are possible with 4 OTUs? (*Show calculation*)
 - Distinguish between Euclidean and Manhattan distance.
 - What is Retention Index?
 - What do you mean by Wallace line?
 - What do you mean by Diphylectic origin of Bird?
2. Answer **any four** questions: [4×10]
- What are the five assumptions or conditions that must be met for a population to be in Hardy-Weinberg Equilibrium? How does violation of these assumptions affect the genetic equilibrium? How do stabilizing, directional, and disruptive selection differ in terms of their effects on population traits? (4+2+4)
 - Write a short note on founder effect and population Bottleneck. Mention different types of dispersal. What do you mean by Bathymatric distribution? What is gene pool? (2.5+2.5+3+1+1)
 - Illustrate Miller and Urey's experiment on origin of life. Explain RNA world hypothesis. What is microspere? (5+3+2)
 - What are ring species? Explain with an example.
 - Why did the 'Evolutionary Species Concept' fail to explain the existence of discontinuities amongst contemporary species?
 - Why mt DNA is used in DNA barcoding? (3+2+5)
 - Explain briefly the behavioural and morphological approaches in taxonomy.
 - Distinguish between Microtaxonomy & Macrotaxonomy.
 - Define Lectotype, Syntype and Paratype.
 - Distinguish between Phenogram & Cladogram. [(1+2)+2+(1+1+1)+2]
 - What are Dollo characters? Explain with an example.
 - State the molecular evidences in support of hominid evolution from apes.
 - From the given character based data matrix, determine the outgroup, state the various possibilities of unrooted trees that can be constructed and determine the most suitable phylogenetic tree through analyses of all possible networks:

	Taxa			
Characters	A	B	C	D
1	0	1	1	1
2	0	0	1	1
3	0	0	1	1
4	0	1	0	1
5	0	0	1	1
6	0	1	0	0

[(1+1)+(3+5)]

- g) Write the zoological features of Australian region? Mention its different subregions. Why this realm is unique in mammalian distribution? Write one example of Birds and reptiles from this region. (3+3+2+2)
- h) 'Darwin's finches offers excellent example of adaptation radiation'—Justify this statement in relation to its beak structure. Which factors influenced the size and shape of Darwin Finches? Explain adaptive radiations of Galapagos finches in the light of convergent and Divergent evolution. (3+2+5)

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