

U.G. 6th Semester Examination-2026

ZOOLOGY**[MAJOR-X]**

Course Code : ZOO-MJ-T-603

(Evolutionary Biology and Ethology)

[NEP-2020]

Full Marks : 40

Time : 2½ Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any five of the following: 2×5=10
- a) What is molecular phylogeny?
 - b) Differentiate between *Australopithecus* and *Ramapithecus*.
 - c) What is selection coefficient?
 - d) How does microevolution differ from macroevolution?
 - e) Mention any two unique human characters.
 - f) Define eusociality with suitable example.
 - g) What are the circadian rhythms?
 - h) State the biological species concept.

[Turn Over]

2. Answer any **two** of the following: $5 \times 2 = 10$
- How are subspecies formed through the process of speciation? Explain with the help of a suitable example. Differentiate between Peripatric and Parapatric speciation. $3+2$
 - How would you define conditioning? Justify your answer by mentioning the principal types of conditioning in nature with examples. $2+3$
 - Explain how mutation and genetic drift influence the Hardy-Weinberg equilibrium? Differentiate between convergent and divergent evolution. $3+2$
 - What is reciprocal altruism? State the principle of Hamilton rule. What in Kin selection. $2+2+1$
3. Answer any **two** of the following: $10 \times 2 = 20$
- What is Hardy Weinberg equilibrium? The MN blood type is determined by a pair of codominant alleles, L^M and L^N . A population of 600 persons had blood type with the following results: 300 were type M, 240 were type of MN and 60 were N. Calculate the gene frequency of L^M and L^N . What is the frequency of heterozygous Aa in a random mating population if the frequency of recessive phenotype (aa) is 0.09? $2+4+4$

- b) Write short notes on (any **four**): $2 \frac{1}{2} \times 4 = 10$
- Bottleneck effect
 - Sexual selection
 - Molecular clock
 - Adaptive radiation
 - Neutral Evolution
- c) What is meant by mate choice? Differentiate between inter- and intra- sexual selection with examples. Add a note on the evolutionary impact of sexual selection. What is panmictic population? $2+3+3+2$
- d) What is nuptial flight? Write a short note on the division of labour in honey bee colony. What is age polyethism in honey bees? State the role of Founder's effect and evolutionary bottlenecks in changing allele frequencies. $2+4+2+2$