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Your Roll No.....

1349

B.Sc. (Hons.)/III **A**

ZOOLOGY—Paper VIII

(Evolution and Zoogeography)

(Admissions of 2004 onwards)

Time : 3 *Hours* *Maximum Marks* : 55

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *Five* questions in all, including

Q. No. 1, which is compulsory.

1. (*a*) Explain in brief : 4

(*i*) Dollo's Law

(*ii*) Kimura's theory of neutral mutations

(*iii*) Heterosis

(*iv*) Bottleneck Phenomena.

(*b*) Differentiate between the following terms : 9

(*i*) Point and Frame-shift mutations

(*ii*) Morphological and Biological species

(*iii*) Compressions and Impressions

(*iv*) Wallace and Weber's Line

(*v*) Corridors and Filters

(*vi*) Anagenesis and Cladogenesis.

P.T.O.

(*c*) Mention any *one* contribution of the following scientists : 2

(*i*) G.G. Simpson

(*ii*) S.W. Fox

(*iii*) Alfred Wegener

(*iv*) P.L. Slater.

(*d*) Name the Zoogeographical realms to which the following animals belong : 2

(*i*)	Red Panda	*Ailurus fulgens*
(*ii*)	Tiger Cat	*Dasyurus maculates*
(*iii*)	Green Anaconda	*Eunectes murines*
(*iv*)	Ring tailed Lemur	*Lemur catta.*

(*e*) Which of the following statements is True *or* False ? Give supportive reasons to your answer : 2

(*i*) Most of the organisms subjected to artificial selection are infertile.

(*ii*) Over-reproduction is the driving force in evolution.

2. (*a*) Describe the geographical areas/boundaries and habitats of the Australian region. Why there is high endemism in this region ? Compare the mammalian fauna of this region with neotropical, ethiopian and oriental regions. 5

(*b*) Name the lung fishes and their distribution in the various biogeographical realms. What reasons would you attribute to gaps in their distribution ? 4

3. (*a*) Define uniform and mass extinctions. Categorize the various episodes of mass extinctions with their possible causes. 5

(*b*) Explain genetic drift and its significance with an example. Why is drift more likely in small populations ? 4

4. (*a*) State Hardy-Weinberg law (equilibrium). Discuss the *five* conditions necessary to prevent changes in gene frequencies. In what way the law can be used in population genetics ? 5

(*b*) What are gene families and how do they originate ? In what way gene families show concerted evolution ? 4

5. (*a*) List any *three* differences between *Australopithecus africanus* and *A. afarensis* based on fossil evidences. Discuss the three-pronged hypothesis of origin of Australopithecines. 5

(*b*) Discuss the various *pre-mating* isolating mechanisms. 4

6. (*a*) Discuss the *two* views (hypothesis or models) of origin of modern humans. 5

(*b*) Explain the differences between a positive and negative type of natural selection. 4

7. Write short notes on any *three* of the following : 3,3,3

(*i*) Synthetic theory of evolution (Neo-Darwinism)

(*ii*) Phylogenetic tree of modern horse *Equus*

(*iii*) Endosymbiont theory

(*iv*) Chromosomal aberrations

(*v*) Carbon-dating.