

**Ph.D. ENTRANCE EXAMINATION, NOVEMBER 2009**

FACULTY OF SCIENCES

**ZOOLOGY**

Time: 140 Minutes

Maximum Marks: 160

**Note:** Answer **any twelve** questions from Section **B** and **one** question from Section **C** in the subject concerned. In Section **B**, **each** question carries **10** marks. Section **C** carries **40** marks. In Section **B** an answer should not exceed **100** words. In Section **C**, an answer should not exceed **500** words.

**SECTION - B**

1. Distinguish between holometabolous and hemimetabolous insect.
2. What is 'unit membrane' concept?
3. Precisely explain cell theory.
4. Distinguish between niche and habitat.
5. How are ecological 'hot spots' important?
6. What is the role of interference RNA?
7. How is mitochondrial DNA important in Phylogenetic analysis?
8. Briefly explain the principle of PCR.
9. What is a 'knock out' mouse? How are they important?
10. What are transgenic plants?
11. Briefly explain the functional significance of reticular formations of the brain.
12. Compare the physiological role of acetyl choline and adrenaline as neurotransmitters.
13. How does a protein hormone act at the target cell level?
14. What are melanopsin cells?
15. What is meant by pluripotency?
16. What is the evolutionary significance of 'reproductive isolation'?

**SECTION - C**

1. Name the hormones of the 'Hypothalamo-Pituitary-Gonadal axis'. Briefly explain the function of each.
2. What is Neo-Darwinism? Describe the major concepts that are involved in it.

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3. Substance 'PS' obtained from a plant is suspected to have some haematological influence. State a hypothesis for the above possibility. Design an experiment to verify the hypothesis you have stated; select 2/3 logical parameters for quantitative data. Comment on the Data summarization, statistical techniques for data analysis and interpretation.

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