



'समानो मन्त्रः समितिः समानी'

**UNIVERSITY OF NORTH BENGAL**

B.Sc. Honours 6th Semester Examination, 2022

**DSE-P4-ZOOLOGY**

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.*

**The question paper contains three groups: GROUP-A, GROUP-B and GROUP-C**

**The candidates are required to answer any *one* from *three* groups.**

**Candidates should mention it clearly on the Answer Book.**

**GROUP-A**

**ANIMAL BIOTECHNOLOGY**

1. Answer any *five* of the following: 1×5 = 5
  - (a) Define Pseudogene.
  - (b) Why Type II Restriction Enzymes are widely used for recombinant DNA technology?
  - (c) What is Klenow fragment?
  - (d) Why ddNTPs are called chain terminators in DNA sequencing reactions?
  - (e) What is molecular probe?
  - (f) Write the source of DNA Taq Polymerase.
  - (g) What is mitogen?
  - (h) What is gene pharming?
  
2. Answer any *three* of the following: 5×3 = 15
  - (a) Describe the Solenoid model of DNA packaging.
  - (b) Write the important features of an expression vector.
  - (c) Briefly write the steps of Polymerase Chain Reaction.
  - (d) Briefly write a note on Southern Blotting.
  - (e) Differentiate between adherent culture and suspension culture. What is serum-free media? 3+2
  
3. Answer any *two* of the following: 10×2 = 20
  - (a) Define IS element. Why transposons are called selfish genetic elements? Write a brief note on C-value paradox. 2+4+4

- (b) Describe the Sanger's method of DNA Sequencing.
- (c) Describe the method of cDNA library construction. How DNA fingerprinting be applied in forensic laboratory? 5+5
- (d) Differentiate between primary and secondary cultures. What are the advantages and disadvantages of cultured cells? What is HeLa Cell Line? 4+4+2

### GROUP-B

#### FISH AND FISHERIES

1. Answer any *five* of the following: 1×5 = 5
- (a) What is stenophagic fish?
  - (b) What is hemibranch gill?
  - (c) Define Lepidophagy.
  - (d) Give an example of stenohaline fish.
  - (e) Write the function of Weberian Ossicles.
  - (f) Name one disease causing fungus.
  - (g) Write the advantage of semi-intensive culture.
  - (h) What is GloFish?
2. Answer any *three* of the following: 5×3 = 15
- (a) Differentiate between polyculture and composite fish culture.
  - (b) Discuss the modifications of mouth in fishes depending on their feeding habit.
  - (c) Differentiate between cycloid and ctenoid scales.
  - (d) What are the major reasons for depletion of fisheries resources?
  - (e) Briefly write on the induced breeding.
3. Answer any *two* of the following: 10×2 = 20
- (a) Discuss the structural modifications of Caudal fin. Explain how scales can be used to determine the age of fishes? Mention its limitations. 4+4+2
  - (b) Name two bacterial diseases of fishes with their symptoms and treatment. What are the different types of cage culture? Write its limitations. 5+3+2
  - (c) Describe the structural adaptations for ram ventilation. Discuss the different types of Swim bladder in fishes and mention their importance. 5+5
  - (d) Discuss on the osmoregulation in elasmobranchs.

**GROUP-C**

**BIOLOGY OF INSECTS**

1. Answer any *five* of the following: 1×5 = 5
- (a) Write the function of organ of Ribaga.
  - (b) What is haemolymph?
  - (c) Name the type of mouth parts in Lepidopterans.
  - (d) What is propolis?
  - (e) Write the differences between oligophagous and polyphagous insects.
  - (f) Write the function of peritrophic membrane.
  - (g) To which order do termites belong?
  - (h) What are halteres?
2. Answer any *three* of the following: 5×3 = 15
- (a) Write briefly the Tracheal gill theory and Paranotal theory for the origin of wings.
  - (b) Write a note on piercing and sucking type of mouth parts.
  - (c) Comment on the structural modifications of antennae.
  - (d) Describe the structure of typical insect cuticle.
  - (e) Briefly describe the respiratory adaptations of aquatic insects.
3. Answer any *two* of the following: 10×2 = 20
- (a) Give the diagnostic characters of order Isoptera and Hemiptera. Write a note on venation of insect wings. What is microtrichia? 4+4+2
  - (b) What is scotopic eye? Draw and describe the structure of ommatidium. Write the process of image formation in insect. 2+4+4
  - (c) What is holometabolous insect? Write the role of Juvenile hormone in insect metamorphosis. What are the different types of cephalic glands present in insects? 2+4+4
  - (d) Describe the nature of damage, prevention and control of any one of the paddy pest. Give an account on the functional classification of different caste of termites. What is trophallaxis? 4+4+2

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