ARUNACHAL PRADESH PUBLIC SERVICE COMMISSION, ITANAGAR SUBJECT: ZOOLOGY

Time : 3 hours

Full Marks: 200

 $4 \ge 10 = 40$

Note: Question No. 1 is compulsory and answer any four from the remaining seven questions. All questions carry equal marks.

Q. No. 1. Attempt any 10 (ten)

- A. Classify the phylum arthropoda (upto subclass) giving examples.
- B. Write the mechanisms of asexual reproduction in amoeba.
- C. Describe the function of ctenidium with the help of a labelled diagram.
- D. Draw a labelled diagram of plasma membrane and write its function.
- E. Write briefly a note on commensalism with examples.
- F. Differentiate between diapsida and anapsida with examples.
- G. Write the different orders along with characteristics of class amphibia.
- H. Differentiate between cercaria and metacercaria larva.
- I. Write briefly the cortical reaction during fertilization.
- J. Describe Mendel's dihybrid ratio with examples.
- K. Give reasons why Balanoglossus is regarded as a hemichordate.
- L. Discuss the phenomenon of incomplete dominance and co-dominance with examples.

Q.No. 2. Attempt any eight (eight)

 $5 \times 8 = 40$

 $8 \times 5 = 40$

- A. Describe the adaptive characteristics of desert animals.
- B. Write the role of pancreas in digestion.
- C. What is retrogressive metamorphosis? Write briefly on neoteny giving examples.
- D. Distinguish between the structure and function of rough and smooth Endoplasmic Reticulum.
- E. Mention the names of ten endangered animal species available in Arunachal Pradesh.
- F. Differentiate between breathing and respiration. Draw the oxyhaemoglobin dissociation curve and write its significance.
- G. What is linkage map? Describe the method of determination and drawing the linkage map in eukaryotes.
- H. Mention few names of harmful insect pests for rice, maize, citrus and silkworm and write briefly on their chemical control.
- I. Draw a labelled diagram of a flame cell and describe its function

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J. Define allele. Write a brief note on multiple allele giving suitable examples.

Q. No. 3. Attempt any five (five)

- A. Define spermiogenesis. Describe the process of spermatogenesis in mammals with labelled diagram.
- B. Explain the water vascular system in echinodermata and its functional significance

C. Describe the meiotic cell division with the help of a neatly drawn labelled diagram.

- D. Define enzyme. Write the functions of lyases, hydrolase and transferase giving suitable example of reactions.
- E. Write the names of different air pollutants and their effect on environment. Comment on the control measures of environmental pollution.
- F. What are neurotransmitters? Explain with labelled diagram the mechanism of impulse conduction through synaptic junction.
- G. Describe the membrane structure of mitochondria and describe the role of inner mitochondrial membrane in ATP generation.

Q. No. 4. Attempt any 4 (four)

$10 \ge 4 = 40$

 $20 \ge 2 = 40$

- A. What is speciation? Write the factors causing different types of speciation in the context of organisms' evolution.
- B. Describe the biochemical evidences of evolution.
- C. What is pH? Write the scale of hydrogen ion concentration of acid, base and water. Describe the properties of colloidal solution giving example.
- D. Describe the different types of cleavage observed in amphibian and avian embryo development.
- E. Describe the chemical composition of protoplasm.

Q. No. 5. Attempt any 2 (two)

- A. Define mutation. Describe the type, causes and consequences of point mutation and chromosomal mutation.
- B. Describe the life cycle of *Plasmodium vivax* with suitable labelled diagram.
- C. What is nephron? Explain the mechanism of urine formation & excretion in mammal with the help of suitable labelled diagram.
- Q. No. 6. Define ecosystem? Describe the different ecosystem types and those found in Indian subcontinent. Discuss the role of biotic and abiotic components in a pond ecosystem explaining the food chain and energy flow involved giving suitable example. 7 + 13 + 20 = 40
- **Q. No. 7.** Write the general characteristics of phylum coelenterata and classify upto subclass. Define polymorphism and explain different types of polymorphism in coelenterates with suitable diagram. Explain the functional and evolutionary significance of polymorphism in coelenterates.

15 + 15 + 10 = 40

Q. No. 8. What is gastrulation? Describe in detail the gastrulation and development of foetal membranes in chick and mammals with suitable diagrams. Write the functional significance of foetal membrane in embryo development.

10 + 15 + 15 = 40

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