

**SECOND SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)  
EXAMINATION, APRIL 2021**

(CBCSS)

Zoology

ZOL 2C 06—SYSTEMATICS AND EVOLUTION

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

**General Instructions**

1. *In cases where choices are provided, students can attend all questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

**Part A**

I. Answer any *four* questions. Each question carries 2 weightage :

- 1 Empiricism.
- 2 Superspecies.
- 3 Levels of taxonomy.
- 4 Linnaean hierarchy.
- 5 Gradualism.
- 6 Y-MRCA.
- 7 Homoplasy.

(4 × 2 = 8 weightage)

**Part B**

II. Answer any *four* questions. Each question carries 3 weightage :

- 8 Explain type method and its importance in Taxonomy.
- 9 Elaborate on morphological taxonomic characters.
- 10 Explain molecular systematics.

**Turn over**

- 11 How would you account for the collapse of orthogenesis ?
- 12 Explain how natural selection operates with respect to sexual selection.
- 13 Write on the ethics related to taxonomic publications.
- 14 Elaborate on the various aspects of neutral theory of molecular evolution.

(4 × 3 = 12 weightage)

### Part C

III. Answer any *two* questions. Each question carries 5 weightage :

- 15 Elaborate on the various taxonomic impediments. Add a note on the solutions to overcome the impediments.
- 16 Write on different types of taxonomic keys. Mention the merits and demerits of each key.
- 17 Explain different species concepts.
- 18 Explain the significance of population genetics in evolutionary studies.

(2 × 5 = 10 weightage)

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ZOL 2C 05—MOLECULAR BIOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

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**Part A**

I. Answer any *four* questions. Each question carries 2 weightage :

- 1 IS elements
- 2 Gene conversion
- 3 Salient features of human mitochondrial genome
- 4 Interrupted mating and gene mapping.
- 5 Semi conservative mode of replication.
- 6 Name any Inhibitor of translation and its mode of action.
- 7 How Arabinose Operon is different from other operones ?

(4 × 2 = 8 weightage)

**Part B**

II. Answer any *four* questions. Each question carries 3 weightage :

- 8 Write on prokaryotic and eukaryotic ribosomes.
- 9 Explain the role and significance of different types of restriction enzymes.

**Turn over**

- 10 Explain the role of transcriptional factors in mRNA synthesis.
- 11 Write on transposable elements in bacteria.
- 12 Write features of prokaryotic and eukaryotic RNA polymerases.
- 13 Elaborate the mechanisms of gene expression in  $\lambda$ -phage.
- 14 Write an account on different kinds of eukaryotic DNA and its reassociation kinetics.

(4 × 3 = 12 weightage)

### Part C

III. Answer any *two* questions. Each question carries 5 weightage :

- 15 Write an account on different DNA repair mechanisms.
- 16 Write an essay on organization of globin genes in human. Explain how their expression is developmentally controlled.
- 17 Write an essay on the role of inhibitors in translational studies in prokaryotes and eukaryotes.
- 18 Write an account on genetic transfer mechanisms in prokaryotes.

(2 × 5 = 10 weightage)

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ZOL 2C 04—PHYSIOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

**General Instructions**

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**Section A**

I. Answer any *four* questions. Each question carries 2 weightage :

- 1 Comment on the composition of lymph.
- 2 Briefly explain acclimatization.
- 3 What is reticular formation ?
- 4 What are semilunar valves ?
- 5 Comment on Brodman map.
- 6 What is visual cycle ?
- 7 Briefly write on glomerular filtration.

(4 × 2 = 8 weightage)

**Section B**

II. Answer any *four* questions. Each question carries 3 weightage :

- 8 Write an account on the various types of movements of gastrointestinal tract.
- 9 Explain the physiological anatomy of cardiac muscle.
- 10 Enumerate the structure and functions of juxtaglomerular apparatus.

**Turn over**

- 11 Describe the neural organization of retina.
- 12 Explain the structure of spinal cord.
- 13 Elaborate on limbic system and its functions.
- 14 Comment on pulmonary volume and capacities.

(4 × 3 = 12 weightage)

### Section C

III. Answer any *two* questions. Each question carries 5 weightage :

- 15 Explain the organization and functions of brain stem.
- 16 Describe the mechanisms of concentration of urine.
- 17 Enumerate the neural and chemical regulation of respiration.
- 18 Explain taste receptors and the physiology of taste.

(2 × 5 = 10 weightage)