[This question paper contains 4 printed pages.]

Your Roll No.....

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Sr. No. of Question Paper : 2348

Unique Paper Code : 42234406

Name of the Paper : Genetics and Evolutionary Biology

Name of the Course : B.Sc. (Prog.)

Semester : IV

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt Section A & B on separate sheets.

SECTION A – GENETICS

Answer **three** *questions in all.*
Question No. **1** *is compulsory.*

1. (a) Distinguish between any **three** of the following : (6)

(i) Autopolyploidy and allopolyploidy

(ii) Paracentric inversion and pericentric inversion

P.T.O.

(iii) Transition and transversion

(iv) Test cross and back cross

(b) Define any **five** of the following : (5)

(i) Frame shift mutations

(ii) Barr body

(iii) Allele

(iv) Epistasis

(v) Linkage

(vi) Aneuploidy

(c) Give a suitable example for the following : (3)

(i) A virus used for fusing somatic cells *in vitro*.

(ii) A syndrome in human due to monosomy.

(iii) A chemical mutagen.

2. (a) Explain any two non-allelic gene interactions that modify Mendelian dihybrid ratio. (6)

(b) Explain the inheritance of Kappa particles in *Paramecium*. (6)

3. (a) Discuss the method of somatic cell hybridization. How is it used for gene mapping? (8)

(b) Explain pleiotropy with suitable examples. (4)

4. Write short notes on any **three** of the following : (4+4+4)

(a) Multiple alleles

(b) Translocations

(c) Sex Determination in *Drosophila*

(d) Chromosomal theory of inheritance

SECTION B – EVOLUTIONARY BIOLOGY

Attempt **three** *questions in all, including Question No.* **1** *which is compulsory.*

1. (a) Define any **four** of the following : (4)

(i) Ring species

(ii) Neo-Darwinism

(iii) Body fossils

(iv) Divergent evolution

(v) Coacervate

(b) Differentiate between the following : (6)

(i) Peripatric speciation and parapatric speciation

(ii) Continuous variations and discontinuous variations

(iii) Centripetal selection and centrifugal selection

(c) Comment on the following statements : (3)

(i) The frequency of the sickle-cell allele is generally higher in areas endemic to malaria.

(ii) Fossil records support the theory of evolution.

2. (a) Describe the major postulates of Darwin's theory of evolution. (6)

(b) Give the salient features of theory of biochemical origin of life. (6)

3. Explain the various reproductive isolating mechanisms with suitable examples. (12)

4. Write short notes on any **three** of the following : (4+4+4)

(a) K-T mass extinction

(b) Macroevolution

(c) Industrial melanism

(d) Organic variations