K23P 0459

Reg. No. : .....

Name : .....

II Semester M.Sc. Degree (CBSS – Reg./Supple./Imp.) Examination, April 2023
(2019 Admission Onwards)
BOTANY
BOT2C07 : Genetics, Evolution and Biometrics

Time : 3 Hours Total Marks : 60

I. Answer **any two** of the following : **(2×8=16)**

1) 'The primary transcription product of most of the genes in eukaryotes, called a precursor of mRNA or pre-mRNA, is not ready to be translated; instead it is processed and modified extensively before translation." Explain.

OR

2) Write an account on the different types of DNA repair mechanisms.

3) What are statistical significance tests ? Describe a statistical test that can be used to evaluate the significance of deviation of observed values from expected values.

OR

4) Write an account on the Operon model for the regulation of gene expression in prokaryotes.

II. Answer **any two** of the following : **(2×6=12)**

5) a) What is the role of Gyrase ? **1**

b) What is the function of 3' – 5' exonuclease activity of DNA polymerase during DNA replication ? **2**

c) 'Population genetics is a useful tool for studying evolution and quantifying how evolution operates.' Explain. **3**

6) a) What is the gene pool ? **1**

b) What is QTL ? Does a QTL contain one gene or multiple genes ? **2**

c) Explain the process of genetic divergence. **3**

P.T.O.

7) a) What is genetic linkage ? **1**

b) What is regression in statistics ? **2**

c) What is molecular clock ? What is it used for ? **3**

III. Answer **any six** of the following : **(6×3=18)**

8) How does meiosis contribute to genetic recombination ?

9) Draw a rough sketch of mature eukaryotic mRNA (nucleotide sequences are not expected) showing all the important features.

10) Write a brief account on the types and causes of mutations.

11) What are Okazaki fragments ? Explain the situation that necessitates the formation of Okazaki fragments during DNA replication.

12) Explain the neutral theory of molecular evolution.

13) What is molecular phylogeny ?

14) Differentiate between standard deviation and standard error.

15) Explain polygenic inheritance, giving suitable examples.

IV. Answer **any seven** of the following : **(7×2=14)**

16) State Hardy Weinberg law and explain.

17) What is gene duplication ?

18) What is Euthenics ?

19) What is the main reason that 16S rRNA is commonly used to compare evolutionary relationships between organisms ?

20) Explain the genetics of blood groups in man.

21) Differentiate between simple correlation and multiple correlation, citing suitable examples.

22) Explain the purpose of having replications while designing scientific experiments.

23) What are the properties of a normal distribution ?

24) Explain the role of polyploidy in evolution.

25) What is the difference between heritability and heredity ?