



K24P 0835

Reg. No. :

Name :

**Second Semester M.Sc. Degree (CBSS – Supple. (One Time Mercy
Chance)/Imp.) Examination, April 2024
(2014 to 2022 Admissions)**

BOTANY

BOT2C07 : Genetics, Evolution and Biometrics

Time : 3 Hours

Max. Marks : 60

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

1) Write an account on the different methods of regulation of gene expression found in eukaryotes.

OR

2) What is linkage map ? Giving a suitable example, explain how linkage maps are constructed.

3) Measures of central tendency makes it possible to represent a whole set of data with a single central value. Explain with reference to the three main measures of central tendency.

OR

4) What is molecular phylogeny ? Explain the commonly used tools and techniques in molecular phylogeny.

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

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

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

c) What is QTL ? What technique is commonly used to identify QTLs ? **3**

6) a) Name the bond that connects nucleotides in a polynucleotide chain. **1**

b) What is Pribnow box ? **2**

c) Describe the structure of an operon. **3**

7) a) What is speciation ? **1**

b) What is cataclysmic evolution ? Comment on the hindrances to cataclysmic evolution. **2**

c) How does the calculated value of Chi-square is interpreted ? **3**

P.T.O.



III. Answer **any six** of the following.

(6×3=18)

- 8) Draw a rough sketch of tRNA showing its general features.
- 9) Lac operon is under both negative and positive control. Explain.
- 10) 'If double crossover occurs at the expected frequency, then coincidence would be 100%, and if double crossover does not occur at all, then coincidence would be 0%.' Explain.
- 11) Explain the semidiscontinuous replication of DNA.
- 12) Write a brief account on the neutral theory of molecular evolution.
- 13) Evaluate the significance of gene duplication as an evolutionary event.
- 14) What is eugenics ? Explain the methods adopted to achieve its aims.
- 15) Compare and contrast between mean deviation and standard deviation.

IV. Answer **any seven** of the following.

(7×2=14)

- 16) What are the main advantages of CRD as an experimental design ?
- 17) What is the role of DNA polymerase I in DNA replication ?
- 18) What is meant by degeneracy of the genetic code ?
- 19) How does ectopic recombination leads to gene duplication ?
- 20) What are the main applications of Chi-square test ?
- 21) How does genetic drift leads to genetic divergence ?
- 22) What is heritability ? How do we estimate heritability ?
- 23) Differentiate between gene frequency and genotype frequency.
- 24) Explain the general features of a normal probability distribution.
- 25) Polyploidy is a fundamental process in evolution. Substantiate.

SIR SYED COLLEGE

CENTRAL LIBRARY