

Department of Botany
School of Chemical & Life Sciences
Jamia Hamdard, New Delhi-110062

B.Sc. (Hons.) / B.Sc. (Hons with Research) – Botany, II Semester Examination, 2023

Paper Name: **Plant Molecular Biology**
Time: **2 ½ hours**

Paper Code: **BBO-MIC201**
Maximum Marks: **60**

SECTION A

Q. 1. Very Short Type Question

(15 x 1 = 15 marks)

i.	Which is the most unstable type of RNA molecule?
ii	What is a promoter?
iii	How many subunits are there in E. coli RNA polymerase?
iv	Write about genetic code.
v	What is the Okazaki fragment?
vi	List out the forces that stabilize the structure of DNA.
vii	Explain the central dogma of molecular biology.
viii	Explain exons and introns.
ix	Define telomere.
x	What are Heat Shock Proteins (HSPs)?
xi	The sequence of a strand of DNA is ATTGCCGTC. If this strand serves as the template for DNA synthesis, what will be the sequence of the newly synthesized strand?
xii	The template strand of a gene being transcribed is CTTGCCAGT. What will be the sequence of the RNA made from this template?
xiii	The human α -globin chain is 141 amino acids long. How many nucleotides in mRNA are required to encode human α -globin?
xiv	Who proposed the Double Helix structure of DNA?
xv	The principle of chemistry of DNA synthesis is given by.

SECTION B

Q.2. Short Type Question (Attempt any four)

(4 x 5 = 20 marks)

i	Explain Double helical structure of DNA and list the salient features of it.
ii	What are positive regulators (activators) and negative regulators (repressors)?
iii	Explain the wobble hypothesis.
iv	What is transcription attenuation? Explain the operon regulated by this process.
v	Distinguish prokaryotic and eukaryotic transcription.
vi	What are post-translational modifications of proteins? Explain it briefly.

SECTION C

Q.3. Long type Question (Attempt any two)

(2 x 12.5 = 25 marks)

i	Describe various steps of DNA replication in prokaryotes and discuss the enzymes involved in this process.
ii	DNA is a genetic material - prove with conducted experiments.
iii	Define lac operon and draw a schematic diagram of lac operon.