

Roll No. _____

JAMIA HAMDARDSCHOOL OF CHEMICAL AND LIFE SCIENCES
DEPARTMENT OF BIOCHEMISTRY**MSc Biochemistry, Semester I Examination, 2023****Paper Code: MBC 106**
Paper Title: Molecular Biology 1

Time: 1½ h

Max Marks: 30

Note: This paper has 3 Sections, A, B, and C. Attempt all three sections. Section A: Answer all the questions; Section B: Answer any one; Section C: Answer all the questions, each question in this section has an internal choice

Course/Program Learning Outcomes (CLO/PLO) and Blooms Taxonomy Levels (BTL):

- CLO-1: Understand concepts
 CLO-2: Systematically learn the processes
 CLO-3: Gain knowledge of mechanism
 CLO-4: Comprehend how things are integrated
 CLO-5: Analyze and evaluate processes

SECTION A
Attempt All Questions

(1x6=6 Marks)

Q. No. 1	OBJECTIVE QUESTIONS	BTL	CLO	PLO
(a)	(i) COT curves are used to analyze the _____ of DNA in solution.	1	2	3
	(ii) _____ are enzymes involved in resolving topological problems during DNA replication in both eukaryotes and prokaryotes.	3	2	3
	(iii) In prokaryotes, DNA replication occurs bidirectionally from a single _____, while in eukaryotes, it occurs bidirectionally from multiple _____.	4	1	2
	(iv) RNase P is an enzyme involved in _____ processing of RNA, including splicing, cap addition, and polyadenylation.	1	4	3
	(v) The classical Hershey-Chase experiment used _____ and _____ to confirm that DNA, not protein, is the genetic material.	3	3	2

(vi)	The packaging of DNA into a condensed and compact structure is facilitated by _____ proteins.	5	2	3
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SECTION B
Attempt Any One

(1x12=12 Marks)

Q. No. 2	LONG ANSWER QUESTIONS	BTL	CLO	PLO
a)	Explore the functions of different enzymes participating in DNA replication. Provide insight into the exclusive occurrence of replication in the 3' direction.	3	2	3
b)	Evaluate the stages of transcription in prokaryotes and eukaryotes. Highlight the key regulatory elements involved in the initiation, elongation, and termination of transcription.	5	5	2

SECTION C
Attempt All Three Questions

(3x4=12 Marks)

Q. No. 3	SHORT ANSWER QUESTIONS	BTL	CLO	PLO
a)	What is semi-discontinuous replication, explain with example of Okazaki's bacteriophage experiments. OR Provide a comprehensive overview of the experimental approach to validate the semiconservative replication.	4	5	3
b)	What is the capping mechanism for Eukaryotic nascent mRNA. OR Provide an overview of self-splicing mechanisms.	3	2	3
c)	Discuss the common mechanisms of transcription inhibition with examples. OR Provide the conventional naming system for genes and transcript sequences.	4	3	2

END OF THE QUESTION PAPER