

Roll No:

Jamia Hamdard
Department of Biochemistry
School of Chemical and Life Sciences, New Delhi-110062

M.Sc. Biochemistry, Semester-III Examination-2023
Paper Title: Genetic Engineering
Paper Code: MBC 302

Time: 3 hour

Max Marks: 75

Note: This paper has 3 sections A, B, and C, Attempt all the three sections

Section A: Answer all the questions; Section B: Answer any 2 out of 4; Section C: Answer all the questions, each question has an internal choice

Abbreviations Used

CLO- Course Learning Outcome, PLO- Program Learning Outcome, BTL- Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create

Section A (Attempt all questions)

(1X10=10 Marks)

Q. No	Questions	BTL	CLO	PLO
a	pUC19 is a commonly used expression vector (True/False).	1	1	3
b	The sequence of satellite DNA do not code for proteins (True/False).	3	1	3
c	The Klenow fragment is basically a	2	2	2
d	DNA ligases play an essential role in	1	2	3
e	Plus and minus sequencing is the other name for Sanger sequencing (True/False).	4	3	2
f	SYBR green is commonly used in semi-nested PCR (True/False).	2	3	3
g	Annealing temperature is independent of primers used in the PCR. (True/False).	2	3	3
h	An inducible gene is one whose transcription is switched on by addition of a chemical to the growth medium. (True/False).	1	4	3
i	Ligase Chain Reaction employs a thermostable ligase. (True/False)	3	4	3
j	Scorpion probes can be used for both PCR and fluorescence-based genotyping. (True/False)	3	4	3

SECTION B: Long type Questions (Attempt any two out of four)

(2X15=30 Marks)

Q. No	Questions	BTL	CLO	PLO
1	Discuss the various types of PCR. Also highlight its application in diagnostics.	1	3	3
2	Briefly discuss the production, purification, and characterization of recombinant proteins?	2	4	2
3	Discuss the various DNA sequencing methods and strategies for genome sequencing.	4	1	3

4	Enlist the differences between a cloning vector and an expression vector. Also highlight the factors that affect the expression of cloned genes.	3	2	2
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SECTION C: Short-type Questions. (Attempt all questions, each question has an internal choice) (5X7=35 Marks)

Q. No	Questions	BTL	CLO	PLO
1	What is site directed mutagenesis? OR Write a short note on the synthesis of cDNA.	1	1	3
2	Write a note on Baculovirus expression systems giving suitable examples. OR Define 'Codon bias' Why is it significant?	2	2	3
3	What do SNPs stand for? List different techniques that can be used to identify new SNPs and/or detect known SNPs. OR What is FISH? Mention its application.	1	3	2
4	Write a short note on CRISPR/Cas9 system. OR Discuss chromosome engineering and mention few of its application.	3	4	3
5	Discuss a method for the isolation and purification of nucleic acid. OR Write a short note on homopolymeric tailing.	2	1	3
6	Write a short note on Host engineering OR Write a short note on Vector engineering.	1	2	3
7	Discuss methods for the analysis of gene expression at RNA level. OR Discuss methods for studying expression at protein level.	4	4	3
