



LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY

SECOND SEMESTER – APRIL 2025

PBT2MC02 – RECOMBINANT DNA TECHNOLOGY



Date: 26-04-2025

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

SECTION A – K1 (CO1)

Answer ALL the questions

(5 x 1 = 5)

1 Choose the best option

- a) Which subunit of the *E. coli* polymerase confers specificity to transcription?
i) α ii) β iii) β' iv) σ
- b) Daniel has run a PCR reaction for 10 cycles, how many DNA duplexes would have been produced?
i) 20 ii) 10 iii) 1024 iv) 10324
- c) Which of the following is correct for plasmid pBR322?
i) ampr ii) tetr iii) ampr and tetr iv) HindIII and EcoRI
- d) Which of the following base-pairing rule is correct?
i) Adenine with guanine and thymine with cytosine
ii) DNA base pairing is non-specific
iii) Adenine with cytosine and guanine with thymine
iv) Adenine with thymine and guanine with cytosine
- e) Termination of replication is triggered by
i) DNA polymerase ii) Helicase iii) SSB iv) Tus protein

SECTION A – K2 (CO1)

Answer ALL the questions

(5 x 1 = 5)

2 Answer in one or two sentences

- a) Compare GMO and LMO.
- b) What is a probe?
- c) What was first recombinant product developed?
- d) Name two plasmids used in rDNA technology.
- e) What is siRNA?

SECTION B – K3 (CO2)

Answer any THREE of the following

(3 x 10 = 30)

- 3 Illustrate the gene map of pUC 18.
- 4 Compare and contrast double digest from single digest plasmid with diagram.
- 5 Comment on Sanger's sequencing method.
- 6 Discuss the factors affecting PCR reaction.
- 7 Discuss the ethical issues surrounding genetically modified organisms.

SECTION C – K4 (CO3)

Answer any TWO of the following

(2 x 12.5 = 25)

- 8 Discuss about the properties of vector. What is the difference between cloning and expression vector. Explain with an example.
- 9 Illustrate the blotting technique used for DNA confirmation.

10	Discuss the NGS and its applications.
11	Relate on the safety aspects of genetically modified organisms and their release into the environment.
SECTION D – K5 (CO4)	
	Answer any ONE of the following (1 x 15 = 15)
12	Grade the different types of DNA modifying enzymes their sources and mechanism of action.
13	Prioritize the Biosafety regulatory framework for GMOs in India.
SECTION E – K6 (CO5)	
	Answer any ONE of the following (1 x 20 = 20)
14	Write in detail the various DNA sequencing methods.
15	Elaborate on technique which are used in confirmation of foreign proteins.

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