

IV SEMESTER B.TECH. (BIOTECHNOLOGY)

END SEMESTER EXAMINATIONS, JUNE 2022

SUBJECT: MOLECULAR BIOLOGY AND GENETIC ENGINEERING

[BIO 2253]

REVISED CREDIT SYSTEM

Time: 3 hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- ✤ Missing data may be suitably assumed.

1A.	A researcher prepared an extract fromType IIIS pneumococcal bacterial cells. He then treated this extract with a mixture of Protease, RNase and DNase. What will be the effect of this treatment on the ability of the extract to transform recipient Type IIR cells to Type IIIS and why? From this experiment can it be concluded that DNA is the transforming principle? Justify.	4M
1B.	Explain the principle of DNA microarray? With an example elaborate how it can be used.	3M
1C.	Elaborate on the mechanism leading to termination of translation.	3M
2A.	Parkinson's disease (PD) is a neurodegenerative disorder affecting the movement of a person. It has been identified that this disease is because of the accumulation of a faulty protein. Is it possible to treat PD with RNAi? If yes, what will be the strategy, elaborate.	4M
2B.	During replication how do the histones get distributed?	3M
2C.	How do transformation and transduction differ from each other? Elaborate.	3M
3A.	Elaborate on homopolymer tailing.	4M
3B.	What are base analogues and how may they result in mutations? Elaborate.	3M
3C.	List the various sources of DNA for cloning.	3M
4A.	What is the need for post-translational modifications? Elaborate on Glycosylation and prenylation.	4M
4B.	What change can be brought to a wild-type λ DNA to use it as a suitable cloning vector?	3M

4C.	In what ways are human artificial chromosomes (HACs) better than viral based vectors? Is it correct to say that synthetic biologists may use HACs to hold entire man-made biological pathways?	3M
5A.	Using rDNA is it possible to overcome the problems of product safety? Elaborate with an example. Mention the steps involved in producing a recombinant protein.	4M
5B.	Elaborate on restriction fragment length polymorphism.	3M
5C.	Explain the following approaches to gene therapy: (i) Gene augumentation (ii) Assisted killing.	3M