

Parvatibai Chowgule College of Arts and Science
Autonomous

B.Sc. Semester End Examination, ~~March~~, 2022

Semester: V

Subject: Biotechnology

Title: Concepts in Genetic Engineering (Core)

Duration: 2 Hours

Max. Marks: 45

Instructions:

- 1) All the questions are compulsory, internal choice is available.
- 2) Figures to the right indicate maximum marks to the question.
- 3) Draw neat labelled diagram wherever necessary.

Q1. Answer ANY THREE of the following: (9)

- a) Mention any three applications of Genetic Engineering.
- b) Explain the term 'palindrome sequence' with an example.
- c) What are Cosmids? How do you construct it?
- d) How many restriction sites are present in lambda DNA of 49 kb with recognition sequence of hexanucleotides?

Q2. Answer ANY TWO of the following: (12)

- a) It is difficult to clone DNA fragments with sticky ends to the vector with blunt ends. How do you overcome this problem?
- b) Explain any three chemical methods of introducing foreign DNA into bacterial cells mentioning one advantage and disadvantage of each method.
- c) Explain the screening of recombinants by colony hybridization using labelled isotopes.

Q3. Answer ANY TWO of the following: (12)

- a) What are the various steps in the construction of a genomic library? Elaborate on the applications of PCR in various fields (any six).
- b) Briefly describe the steps involved in DNA sequencing by chemical degradation method.
- c) Explain the principle of plasmid isolation by alkaline lysis method. How do you achieve the purification of DNA by using organic solvents and chromatographic method?