



QP CODE: 25024469



25024469

Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, APRIL 2025

Fourth Semester

M Sc BOTANY

**ELECTIVE - BY800402 - GENETIC ENGINEERING, GENOME EDITING AND
IMMUNOLOGY**

2019 ADMISSION ONWARDS

2CBE236C

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. What are exonucleases? What is its use in recombinant DNA technology?
2. A recombinant vector with a gene of interest inserted within the gene of the D-galactosidase enzyme is introduced into a bacterium. Explain the method that would help in the selection of recombinant colonies from non-recombinant ones.
3. Define positional cloning. What is its use in rDNA technology?
4. Discuss how does site-specific recombination for *in vivo* gene manipulation differs from homologous recombination.
5. What is the principle of genome editing technique?
6. Define the term pharming.
7. Describe Surface Plasmon Resonance (SPR) based biosensors.
8. Define acquired immunity.
9. What is the cytosolic pathway of antigen presentation?
10. Why monoclonal antibodies are preferred over polyclonal antibodies in research, diagnostic and therapeutic purposes? Explain.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. What are shuttle vectors? Illustrate with an example.





12. Give a brief account of *in vitro* phage packaging.
13. Explain the methods of introduction of phage DNA into bacterial cells.
14. Differentiate between antisense RNA and RNAi technology.
15. Discuss the role of genetically modified microbes in basic research.
16. Discuss the role of genetically modified animals in modelling human diseases.
17. Explain the impact of MHC diversity loss on disease susceptibility.
18. Write a short note on Cell-mediated Hypersensitivity.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

Weight 5 each.

19. Describe in detail the methods for the identification of desirable clones from a genomic DNA library.
20. Explain the process of genome editing with special emphasis on methods used in that technology.
21. Write an essay on the approaches used in gene therapy.
22. Write an essay on the protein modification by site-directed mutagenesis.

(2×5=10 weightage)

