

QP CODE: 25050555



Reg No :

Name :

MSc DEGREE (CSS) EXAMINATION, DECEMBER 2025

First Semester

M Sc BIOTECHNOLOGY

Core Courses - BT020102 - CELL BIOLOGY AND GENETICS

2019 Admission Onwards

7B3F799A

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. What is the constitution of plasma membrane?
2. List the features of active transport.
3. What is Soft Endoplasmic reticulum?
4. What are nuclear lamins?
5. What are chromosomes?
6. Define MPF.
7. What is atavism?
8. What is polyploidy?
9. Define natural selection.
10. How do behavioral genetics play a role in developing an individual's lifestyle?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Discuss Hyper Membrane Polarization .
12. Give a detailed structure and physiological role of Tight Junctions.
13. Illustrate Ras pathway.
14. What are the enzymatic components of lysosomes?





15. Explain the functions of chloroplast.
 16. Illustrate meiosis with explanation.
 17. (a) An individual with A blood group (IAIO) got married to an individual with O blood (IOIO) group. Illustrate a cross and determine the possible blood groups of their progenies.
(b) An individual with A blood group (IAIA) got married to an individual with O blood (IOIO) group. Illustrate a cross and determine the possible blood groups of their progenies.
 18. Assume that A is completely dominant over a, with aa individuals displaying a disease while all others are normal. An individual of genotype Aa is called a carrier as they appear normal, but can have offspring with the disease.
 - (i) Under Hardy-Weinberg, if $\text{freq}(a) = 0.001$. What fraction of all copies of a are in carriers?
 - (ii) What fraction of all aa individuals had both parents as carriers (i.e., neither parent displays the trait).
- (6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight **5** each.

19. Compare Prokaryotic and Eukaryotic cells.
20. Discuss the composition and functions of Extra Cellular Matrix.
21. Explain the pathways of Apoptosis.
22. What is cytoplasmic inheritance? Explain the classes of cytoplasmic inheritance and its various aspects with examples.

(2×5=10 weightage)

