

(i) Printed Pages : 2

Roll No.

(ii) Questions : 9 Sub. Code :

1	3	8	6	2
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Exam. Code :

5	0	5	4
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**B.Sc. (Hons.) (Bio-Technology) FYUP 4th Semester
(2056)**

FUNDAMENTALS OF GENETICS

Paper : BTED403

Time Allowed : Three Hours] [Maximum Marks : 68

- Note :—** (1) Attempt **five** questions in all. Question No. 1 is compulsory and covers the entire syllabus.
(2) Attempt **one** question from each unit. All questions carry **14** marks each, except Q. 1 which carries **12** marks.

Compulsory Question

1. Write in brief of the following: 6×2=12
- (a) Model organisms in genetics
 - (b) Extrachromosomal inheritance
 - (c) Tetrad analysis
 - (d) Mutagens and their types
 - (e) Genetic drift
 - (f) Difference between allelic and genetic frequencies.

UNIT-I

2. (a) Describe the cell cycle and its control points in yeast. 7
(b) Differentiate between mitosis and meiosis. Explain the role of meiosis in the life cycle of organisms. 7

3. (a) Explain gene interactions with suitable examples with reference to epistasis, complementary genes. 8
(b) Discuss the chromosomal theory of inheritance. 6

UNIT-II

4. (a) What is recombination and linkage? How is it used for gene mapping? 7
(b) Explain and derive coincidence and interference and how does it affect genetic crossing over. 7
5. (a) Describe inversion and translocation with examples and disease caused by translocation. 8
(b) Discuss position effects and their role in evolution. 6

UNIT-III

6. (a) Classify mutations based on their origin, direction, and effect. 8
(b) Describe screening methods for mutant isolation. 6
7. Discuss structural and numerical chromosomal abnormalities in humans. Give examples of syndromes associated with them. 14

UNIT-IV

8. (a) Explain the Hardy-Weinberg equilibrium with derivation. 7
(b) How do mating systems and sexual selection affect genotype frequencies? 7
9. Differentiate between natural selection and genetic drift. Discuss their roles in microevolution. 14