

Useful for all Medical Entrance Examinations held across India.

MHT-CET Triumph Biology

Based on Maharashtra State Board Syllabus

STD. XII Sci.

Salient Features

- Exhaustive subtopic wise coverage of MCQs.
- Memory Maps provided for each chapter.
- Hints included for relevant questions.
- Exhaustive coverage of various competitive exam questions.
- Includes solved MCQs from MHT CET, NEET (UG) 2015, 2016, 2017.
- Evaluation test provided at the end of each chapter.
- Two Model Question Papers with answers at the end of the book.

*Solutions/hints to Evaluation Test available in downloadable PDF format at
www.targetpublications.org/tp12320*

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Preface

“Std. XII: Sci. Triumph Biology” is a complete and thorough guide to prepare students for a competitive level examination. The book will not only assist students with MCQs of Std. XII, but will also help them to prepare for MHT CET, NEET (UG) and various other competitive examinations.

The content of this book is based on the Maharashtra State Board Syllabus. Memory Maps in the form of charts are provided at the beginning of every chapter. Topic – wise classification of the MCQ’s has been done to help the students understand each concept thoroughly.

MCQs in each chapter are divided into three sections:

 **Classical Thinking** : consists of straight forward questions including knowledge based questions.

 **Critical Thinking** : consists of questions that require some understanding of the concept.

 **Competitive Thinking** : consists of questions from various competitive examinations like MHT CET, AIPMT/NEET, WB JEEM, KCET, AIIMS, EAMCET, CBSE, CPMT, AFMC, etc.

Hints have been provided to the MCQs which are broken down to the simplest form possible.

An **Evaluation Test** has been provided at the end of each chapter and two **Model Question Papers** (as per MHT CET pattern) to assess the level of preparation of the student on a competitive level.

The journey to create a complete book is strewn with triumphs, failures and near misses. If you think we’ve nearly missed something or want to applaud us for our triumphs, we’d love to hear from you.

Please write to us on : mail@targetpublications.org

Best of luck to all the aspirants!

Yours faithfully

Authors

Edition: Second

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01 Genetic Basis of Inheritance

Syllabus

- 1.0 Introduction
- 1.1 Mendelian inheritance
- 1.2 Deviations from Mendelian ratios

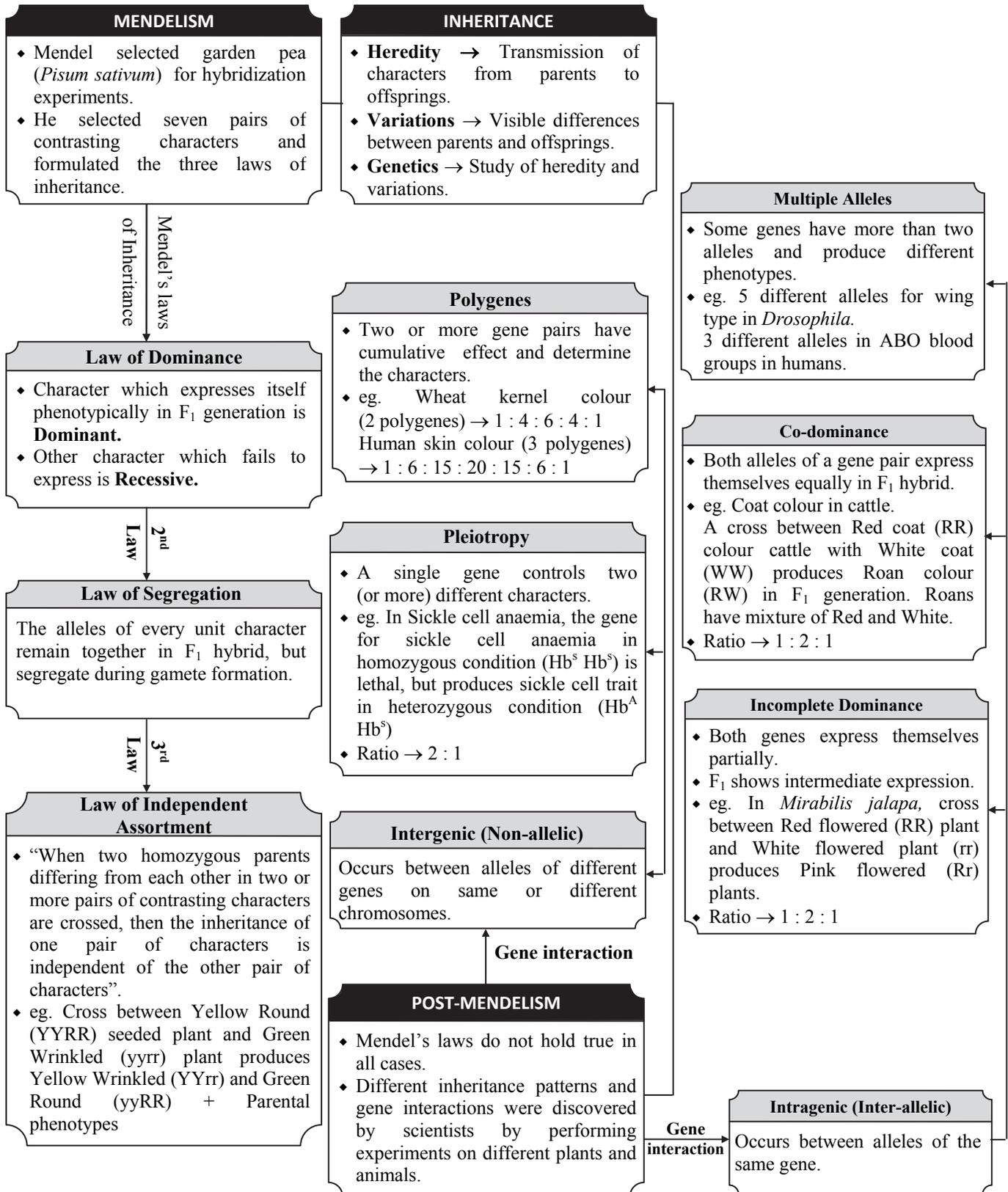
Gregor Johann Mendel (1822 – 1884)



*Gregor Mendel was the first to give the hypothesis of existence of a factor (Mendelian factor; gene) which shows continuity and variation. He conducted several hybridization experiments on Garden pea plant (*Pisum sativum*). His work of experiments and their results were published in the Natural History Society of Bruno in 1866.*



Memory Map





Classical Thinking



1.0 Introduction

1. The phenomenon of 'like begets like' is due to
(A) genetics (B) heredity
(C) germplasm (D) variation
2. Transmission of characters from one generation to the next or from parents to offsprings is called
(A) heredity (B) variation
(C) recombination (D) mutation
3. Variation is
(A) differences between parents and offsprings.
(B) differences between individuals of same species.
(C) differences among the offsprings of the same parents.
(D) all of the above.
4. The term "genetics" was coined by
(A) Morgan
(B) William Bateson
(C) Johannsen
(D) Karl Correns
5. The greek word which means 'to grow into' is
(A) genetics (B) genesis
(C) inheritance (D) factor
6. The first scientific explanation regarding inheritance was given by
(A) William Bateson
(B) Gregor Johann Mendel
(C) Griffith
(D) Johannsen
7. Who is known as "Father of Genetics"?
(A) Theophrastus (B) Stephen Hales
(C) Mendel (D) Aristotle



1.1 Mendelian inheritance

8. Organisms produced by asexual reproduction are called
(A) clones
(B) offsprings
(C) factors
(D) both (A) and (B)
9. Organisms produced by sexual reproduction are called
(A) offsprings (B) clones
(C) characters (D) genes

10. Offsprings are
(A) exactly identical to either of their parents.
(B) not exactly identical to either of their parents.
(C) show intermediate characters inherited from both the parents.
(D) both (B) and (C)
11. The term "factor" for gene was coined by
(A) William Bateson
(B) Johann Mendel
(C) Johannsen
(D) F. Griffith
12. Gregor Mendel was born in
(A) U.K (B) Austria
(C) Russia (D) Czechoslovakia
13. Mendel was a
(A) physiologist (B) mathematician
(C) cytologist (D) taxonomist
14. The first scientific study leading to the formulation of laws of inheritance was carried out by
(A) Darwin (B) Hugo De Vries
(C) Lemarck (D) Mendel
15. Under which title was Mendel's work published in Natural History Society of Brunn?
(A) Mendel's Laws of Inheritance
(B) Experiments in Plant Hybridization
(C) Experiment on Heredity and Variation
(D) Origin of Species
16. Mendel's laws were first published in the year
(A) 1875 (B) 1890
(C) 1928 (D) 1866
17. The year 1900 A.D. is highly significant for geneticists due to
(A) chromosome theory of heredity
(B) discovery of genes
(C) rediscovery of Mendelism
(D) principle of linkage
18. The Mendelian principles of inheritance were rediscovered by
(A) Sutton and Boveri
(B) Hugo de Vries, Tschermak and Correns
(C) Lederberg and Tatum
(D) Morgan



19. Mendel's work was rediscovered by three biologists from which of the following countries?
 (A) Holland, France and England
 (B) Holland, England and Austria
 (C) Germany, France and England
 (D) Austria, Holland and Germany
20. Mendel selected pea plant because of
 (A) its short life span.
 (B) it produced many seeds and large flowers.
 (C) many contrasting characters.
 (D) all of these
21. The botanical name of garden pea is
 (A) *Pisum sativum*
 (B) *Lathyrus odoratus*
 (C) *Mangifera indica*
 (D) *Solanum tuberosum*
22. Which of the following is a dominant character in pea?
 (A) Wrinkled seeds
 (B) Inflated pod
 (C) Terminal flower
 (D) Dwarf plant
23. Which of the following character was not considered by Mendel?
 (A) Seed coat colour
 (B) Wrinkled or round leaves
 (C) Tallness or dwarfness
 (D) Position of flower
24. An inherited character and its detectable variant is called
 (A) allele
 (B) trait
 (C) gene
 (D) both (A) and (B)
25. Which one of the following best describes a gene?
 (A) A triplet of nucleotide bases.
 (B) A specific length of DNA responsible for the inheritance and expression of the character.
 (C) A specific length of single stranded RNA.
 (D) Both (B) and (C)
26. Mendel's "factors" are in fact
 (A) units (B) chromosomes
 (C) genes (D) none of these
27. Who coined the term 'gene' for 'factor'?
 (A) Mendel (B) Morgan
 (C) Johannsen (D) Punnett
28. Alleles or allelomorphs occupy
 (A) same position on homologous chromosomes.
 (B) same position on heterozygous chromosomes.
 (C) different position on homologous chromosomes.
 (D) different position on heterozygous chromosomes.
29. Who proposed the term 'Allelomorph'?
 (A) Hugo De Vries (B) Morgan
 (C) Tschermak (D) Bateson
30. Dominant allele means
 (A) an allele whose effect is masked by another allele.
 (B) an allele that prevents the expression of the other allele.
 (C) an allele without any effect.
 (D) an allele which cannot express in presence of other.
31. The external appearance of an individual for any trait is called as
 (A) phenotype (B) karyotype
 (C) morphology (D) physique
32. Genotype is
 (A) genetic constitution of an organism.
 (B) genetic constitution of somatic cells.
 (C) genetic constitution of plastids.
 (D) genetic constitution of germ cells.
33. Homozygous individuals
 (A) breed true to the trait.
 (B) does not breed true to the trait.
 (C) produce only one type of gamete.
 (D) both (A) and (C)
34. Which of the following term indicates a pair of dissimilar alleles?
 (A) Homozygous
 (B) Heterozygous
 (C) Homologous
 (D) All of these
35. A cross between two pure individuals, differing in atleast one set of characters, is called
 (A) monohybrid (B) polyploid
 (C) mutant (D) variant



36. F_1 generation means
(A) first flowering generation
(B) first fertile generation
(C) first filial generation
(D) first seed generation
37. Filial means
(A) offsprings produced in sexual reproduction.
(B) offsprings produced in asexual reproduction.
(C) offsprings produced in vegetative reproduction.
(D) both (B) and (C)
38. F_2 generation is produced by
(A) crossing F_1 progeny with one of the parents.
(B) selfing the heterozygous progeny.
(C) selfing the parents.
(D) a cross between recessive parents.
39. In genetics, the use of checkerboard was done by
(A) Mendel (B) Correns
(C) Punnet (D) Darwin
40. Mendel, in his experiments
(A) maintained qualitative records.
(B) maintained quantitative records.
(C) conducted ample crosses and reciprocal crosses.
(D) all of the above
41. To eliminate chance factor, Mendel performed
(A) monohybrid cross
(B) dihybrid cross
(C) reciprocal cross
(D) trihybrid cross
42. Mendel always started his experiment (Monohybrid and Dihybrid cross) with
(A) any pea plant
(B) a heterozygous plant
(C) a pure line plant
(D) a fresh new plant
43. Mendel carried out artificial cross by
(A) emasculation of selected female parent plant
(B) emasculation of selected male parent plant
(C) dusting of pollen grains from selected male plant over selected female plant
(D) both (A) and (C)
44. Emasculation means
(A) removal of stamens before anthesis.
(B) removal of stigma before anthesis.
(C) removal of petals before anthesis.
(D) removal of sepals before anthesis.
45. In pea flower, how many stamens are free and how many are fused?
(A) 1, 9 (B) 2, 8
(C) 5, 5 (D) 4, 6
46. F_3 generation was obtained by
(A) selfing F_1 hybrids
(B) selfing F_2 hybrids
(C) crossing F_1 with either parent
(D) none of these
47. What result did Mendel obtained after monohybrid cross between tall and dwarf pea plant?
(A) All new plants were dwarf.
(B) All new plants were tall.
(C) 50% plants were dwarf and 50% plants were tall.
(D) 75% plants were tall and 25% plants were dwarf.
48. When Mendel allowed natural selfing of F_1 hybrids during monohybrid cross between pure tall and pure dwarf pea plant, he found
(A) all plants were tall.
(B) all plants were dwarf.
(C) dwarfness reappeared in some plants.
(D) tallness reappeared in some plants.
49. During monohybrid cross experiments, Mendel performed reciprocal cross by selecting
(A) tall plant as male and dwarf plant as female.
(B) tall plant as female and dwarf plant as male.
(C) both male and female plant as tall.
(D) both male and female plant as dwarf.
50. After performing reciprocal cross between tall and dwarf plants, the ratio of tall and dwarf plants obtained was
(A) 1:2 (B) 3:1
(C) 1:3 (D) 2:1
51. Mendel grouped all contrasting characteristics in _____ pairs.
(A) 15 (B) 14
(C) 7 (D) 6