

6/BOT-350(Th) Syllabus-2023

2026

(May-June)

FYUP : 6th Semester Examination

BOTANY

(Genetics and Plant Breeding)

(BOT-350)

(Theory)

Marks : 56

Time : 3 hours

*The figures in the margin indicate full marks
for the questions.*

Answer Question No. 1 which is compulsory and
four from the rest, selecting one from each Section

1. Write short notes on the following : $4 \times 4 = 16$

- (a) Key differences between meiosis I and meiosis II
- (b) Dosage compensation in sex chromosomes
- (c) Clonal selection in crops
- (d) Cytoplasmic male sterility in plants

26D/1784

(Turn Over)

SECTION—I

2. (a) Describe a typical lampbrush chromosome and explain its significance. 4
- (b) Discuss the roles of cyclins in different stages of cell cycle. 6
3. (a) Highlight the key differences between Mendelian inheritance and extra-nuclear inheritance. 4
- (b) Discuss the role of a non-disjunction in Calvin Bridges' observations on eye colour of *Drosophila*. 6

SECTION—II

4. Differentiate between incomplete dominance and co-dominance during inheritance of phenotypes. A cross between a homozygous plant bearing white flowers and a homozygous plant bearing orange flowers, results in F_1 plants with orange flowers. Selfing of F_1 produces F_2 with yellow, white and orange flowers in the ratio of 3:4:9. Explain the genetic basis for the flower colour phenotypes in the F_2 population. 3+7=10
5. Differentiate between pericentric and paracentric chromosomal inversions. Explain how chromosomal inversions in a heterozygote can lead to chromosomal deletions in the resulting gametes. 3+7=10

SECTION—III

6. (a) Explain how deamination, alkylation and intercalation can lead to gene mutations. 6
- (b) Discuss the effects of domestication on genetic diversity of cultivated crops. 4
7. (a) Citing two relevant examples, discuss the role of artificial selection in crop improvement programmes. 5
- (b) What is hybrid vigour? Discuss how hybrid vigour can be exploited to improve performance in crops. 1+4=5

SECTION—IV

8. Differentiate between chromosome and chromatid found in eukaryotic cells. How do changes in chromosome number in a eukaryotic cell result in euploids and aneuploids? 2+8=10
9. (a) Highlight the merits of mass selection and pure line selection in crop improvement programmes. 5
- (b) Briefly discuss environmental sex determination citing relevant examples. 5
