

6/BOT-353(Th) Syllabus-2023

2026

(May-June)

FYUP : 6th Semester Examination

BOTANY

(**Plant Biotechnology**)

(BOT-353)

(**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 : 4×4=16

- (a) Significance of Murashige and Skoog medium in plant tissue culture
- (b) Essential characteristics of a plasmid vector
- (c) Public perception and controversy surrounding genetically modified crops
- (d) Applications and advantages of cryopreservation

SECTION—A

2. Explain the concept of totipotency in plant cells. Describe its significance in plant tissue culture. 5+5=10
3. Describe a method of anther culture. Discuss its role in the production of haploid plants. 6+4=10

SECTION—B

4. Describe the step-wise process of gene cloning from isolation of nucleic acid to identification of recombinant clones. 10
5. Discuss how PCR and Southern blotting are used to confirm the presence and integration of transgenes in plants. 5+5=10

SECTION—C

6. Citing two relevant examples, discuss how plant biotechnology has improved nutritional quality in crops and assess its potential to address global malnutrition. 4+4+2=10
7. Citing two relevant examples, discuss the role of biotechnology in phytoremediation of contaminated soils. 5+5=10

SECTION—D

8. (a) Discuss the advantages of λ -bacteriophage as a cloning vector. 3
- (b) Citing one relevant example, discuss the advantages and challenges of edible vaccines. 2+2=4
- (c) Discuss single-cell culture and its significance. 3
9. (a) Discuss the causes and consequences of somaclonal variations. 4
- (b) Discuss three mechanisms by which gene silencing can take place in transgenic plants. 3
- (c) Discuss the environmental and biosafety concerns regarding genetically modified (GM) crops. 3
