

AGRICULTURAL BIOTECHNOLOGY
(BIOT 5141)

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.*

Candidates are required to give answer in their own words as far as practicable.

Group - A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) PEPC binds to
(a) O₂ only
(b) CO₂ only
(c) none
(d) both
- (ii) In mycorrhiza fungi colonise
(a) extracellularly
(b) intracellularly
(c) both (a) and (b)
(d) all the above
- (iii) The major advantage of a plant with VAM is
(a) Increased N₂ absorption
(b) Increased P absorption
(c) Increased K absorption
(d) Increased Mn absorption
- (iv) Sterols are
(a) terpenoid
(b) alkaloid
(c) flavonoid
(d) none of these
- (v) Glutathione acts as
(a) Preservative
(b) Antioxidant
(c) Emulsifier
(d) None of these
- (vi) Which of the following is the pair of biofertilizer
(a) *Rhizobium* and grasses
(b) *Azolla* and BGA
(c) *Nostoc* and Legume
(d) *Salmonella* and *E. coli*
- (vii) Specific biomolecules which show easily detectable differences among different strains and species among different species is termed as
(a) DNA fingerprinting
(b) molecular markers
(c) molecular Scissors
(d) RFLP

- (viii) Locations of quantitative genes on chromosomes are called
(a) Qualitative trait loci (b) quantitative trait loci
(c) both of a and b (d) none of these
- (ix) The transgenic plants expressing PHYA cDNA was
(a) Exactly of identical phenotype to that of wild type
(b) Totally different from wild type
(c) Taller than wild type
(d) Shorter than wild type
- (x) The technique for developing transgenic tomato was
(a) Sense RNA (b) Anti-sense RNA
(c) PEG-mediated (d) RNAi

Group - B

2. (a) Define marker. Briefly describe the different types of polymerase chain reaction based markers (cite any two).
(b) Write short notes on the following (any two):
MAS, SCAR, RAMP
 $(2 + 4) + (2 \times 3) = 12$
3. (a) Mention the characteristics which make SSR marker useful for a variety of applications in plant genetics. Name two tools used for database mining in SSR.
(b) Show how SSR markers are advantageous over the other marker systems in crop improvement.
 $(4 + 2) + 6 = 12$

Group - C

4. (a) Compare the traditional and transgenic approach of plant improvement.
(b) How the 'Dwarf' phenotype was successfully used to develop high yielding varieties of crop?
(c) Write the prospect for Second Green Revolution. Why at all it has become utmost necessary?
 $4 + 4 + 4 = 12$
5. How photosynthetic efficiency can be improved by engineering:
(i) Light reaction and
(ii) Dark reaction.
 $6 + 6 = 12$

Group - D

6. (a) Name two physiologically active terpenoids with their source and mode of action.
(b) Terpenoids are secondary metabolites - explain. **8 + 4 = 12**
7. (a) Write the mode of action of ascorbic acid as antioxidant.
(b) Name any two important enzymes from plant source and write their mode of action. **8 + 4 = 12**

Group - E

8. Write short notes on the following:
(i) Cyanobacteria as potential biofertilizer
(ii) Usage of algae as medicine and food. **6 + 6 = 12**
9. (a) Define mycorrhizae.
(b) Mention the different types of mycorrhizae.
(c) Mention the usefulness of this in plant system. Cite its applications in agriculture. **2 + 3 + (4 + 3) = 12**

Department & Section	Submission Link
BT	https://classroom.google.com/c/MjcxNzUxODkzMjU5/a/Mjc1NTM0MjExMjYy/details