

Agricultural Biotechnology
(BIOT 5131) 25

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 alternatives for the following: 10 x 1=10
- (i) Most of the phytoalexins are a type of
(a) terpenoid (b) alkaloid
(c) flavonoid (d) none of these.
- (ii) The enzyme that first fixes CO₂ in C₄ plants is
(a) Rubisco (b) PEPC
(c) Either of (a) & (b) (d) none.
- (iii) In developing BT-plants, the transgene used is
(a) exactly of identical sequence to that of *Bacillus thuringiensis*
(b) totally different from *Bacillus thuringiensis*
(c) codon optimization was performed
(d) promoter was kept same.
- (iv) Which one is not a PCR based marker ?
(a) RFLP (b) RAPD (c) AFLP (d) SSR.
- (v) Acetate-mevalonate pathway is important for production of
(a) IPP (b) flavonoid (c) gibberellin (d) none of them.
- (vi) Essential oil belongs to the group----of secondary metabolites
(a) terpenoids (b) alkaloids
(c) resinous (d) sapogenins.
- (vii) Phenolic phytochemicals have antioxidant property due to presence of
(a) only phenolic ring (b) only hydroxyl ring
(c) both (a) and (b) (d) none of these.
- (viii) Secondary metabolites are produced in
(a) tropophase (b) idiophase
(c) both (a) and (b) (d) none of these.

M.TECH/BT/1ST SEM /BIOT 5131/2015

- (ix) The technology used to develop FLAVR SAVR tomato is
(a) Antisense RNA technology (b) Sense RNA technology
(c) RNAi technology (d) Antisense DNA technology
- (x) HMG CoA reductase is required for the synthesis of
(a) IPP (b) flavonoid
(c) gibberellin (d) none of these.

Group - B

2.(a) Define QTL.

- (a) Mention the situation where advanced backcross AB-QTL analysis is used citing the crop names.
- (b) Describe the process how Eco TILLING method can be used for agricultural applications.

$2 + (3 + 2) + 5 = 12$

3.(a) Mention the categories of molecular marker.

- (b) Mention in which category RFLP lies and discuss how genetic diversity among the plant species are analysed by this type of marker.
- (c) Describe the application of RAPD in plant biotechnology.

$2 + (1+4) + 5 = 12$

Group - C

4.(a) Write short notes on: Green Revolution.

- (b) Compare and contrast breeding vs. Transgenic technology.

$6 + 6 = 12$

5. Describe the detailed mechanism of development of Golden Rice with the help of a flow chart.

12

Group - D

6.(a) What is the difference between primary and secondary metabolites?

- (b) Name any two secondary metabolites of plant and write their mode of action.

$4 + 2 + 6 = 12$

7.(a) What is glyphosate? Write down its mode of action.

- (b) Write any two techniques for developing herbicide resistant plant.

BIOT 5131

2

Group - E

8.(a) What do you mean by Effective Microorganisms for soil to achieve better crop production?

(b) Describe an ideal microbial composition of EM, indicating beneficial effects of each group towards crop improvement.

4 + 8 = 12

9.(a) Define micro propagation and recurrent embryogenesis.

(b) Mention the role of following factors on micro propagation media, genotype and cultural conditions with suitable examples.

(c) Mention the application of both micro propagation and somatic embryogenesis.

2 + 2 + (4*2) = 12