PLANT BIOTECHNOLOGY
(BIOT 3211)

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) C-value is related to
(a) Cardiac value
(b) Complexity of plants
(c) Complexity of any organism
(d) None of these.

(ii) ABRE-35S CaMV (upto -40) chimera is used as
(a) selectable marker gene
(b) visible marker gene
(c) inducible promoter
(d) transgene

(iii) Repeated sequence in genome is present in
(a) Only non-coding region
(b) Only Telomere
(c) Both coding and non coding region
(d) Inside ORF.

(iv) Vir D1/D2 is a/an
(a) Autophosphorylating kinase
(b) Transcriptional activator of *vir* operon
(c) Endonuclease
(d) ssDNA binding protein.

(v) Pathogenesis Resistant proteins are expressed
(a) When a plant is exposed to biotic stress
(b) At the site of infection
(c)Only in plants resistant to pathogen
(d) None of these

(vi) Which one of the following vitamins is an integrated part of plant tissue culture medium?
(a) Nicotinic acid
(b) Myo-inositol
(c) Retinoic acid
(d) Vitamin-C.

(vii) Digitoxin is a/an
(a) Drug for heart disease (b) Anticancer drug
(c) Antifertility compound (d) Antihypertension drug

(viii) Which one of the following is not used for immobilization of plant cells?
(a) Alginate (b) Chitin
(c) Carageenan (d) Hollow fibres

(ix) Plant homeodomain proteins are
(a) Leucine Zipper transcription factor (b) Zn-finger transcription factor
(c) Developmental transcription factor (d) Basal transcription factor.

(x) The basal transcription factor that first binds to the core promoter element in plant is
(a) TF II A (b) TF II B
(c) TF II F (d) TF II D.

Group – B

2. (a) Why explants darken and lose its functionality after transfer to a new media?
(b) What is the actual phenomenon going on and mention how this problem can be overcome.
(c) Write a short note on micropropagation and its importance in plant tissue culture industry.

4 + 4 + 4 = 12

3. (a) Auxin is needed for the sustenance of plant life-justify the statement in view of its application aspect (write any three).
(b) Mention the name of any two synthetic auxins.
(c) Discuss the mode of action of auxin with suitable diagram with respect to acid growth hypothesis.

4 + 4 + 4 = 12

Group – C

4. (a) What are the major differences between primary and secondary metabolites?
(b) Mention briefly any five factors affecting the production of secondary metabolite production.
(c) Name the plant secondary metabolite compound with an antimalarial property and write its chemical nature and biosynthetic pathway.

4 + 4 + 4 = 12

5. (a) What are precursors? Give two examples of precursors with the name of the plant name and product name.

(b) Mention the name of a stress metabolite which is produced in tobacco cell suspension culture and describe how this is produced?

6 + 6 = 12

Group – D

6. (a) What is histone code hypothesis? State its principle in context of nuclear gene regulation in plant.

(b) What are G-box elements?

(c) Differentiate between transposon and retrotransposon.

6 + 3 + 3 = 12

7. (a) How protein turnover is controlled in plant cells? Discuss the molecular mechanisms.

(b) Discuss the regulation of following genes in plant:
(i) Rubisco activase
(ii) AdoMetDC

6 + (3 + 3) = 12

Group – E

8. (a) Compare the following techniques for gene delivery to plant cells:
Protoplast fusion, LASER-mediated.

(b) Mention the role of following components in plant expression vectors:
Kanamycin resistant gene, GFP, 35S CaMV promoter

(3 + 3) + (2 + 2 + 2) = 12

9. (a) Mention two examples gene based herbicide resistance in plants.

(b) Write short notes on the constructs used for the production of Golden Rice with suitable diagrams.

6 + 6 = 12

Department & Section	Submission Link
BT	https://classroom.google.com/c/MzE3NDgxMzAzMzI5/a/MzQwMjYyNTYyMzcy/details