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H-7323

M.Sc. (Semester-II) Examination, July 2022

BIOTECHNOLOGY

(Plant Biotechnology)

Time Allowed : Three Hours

Maximum Marks : 70

Minimum Passing Marks : 25

Note : This question paper is divided into four Sections. Attempt questions from all four sections as per given direction. Distribution of marks is given in each Section.

Section-'A'

(Objective Type Questions)

Note : Attempt **any ten** questions. Each question carries **01** mark . [10x1=10]

1. (a) Fill in the blanks :

(i) Haploid plant is developed using ---------- culture.

(ii) Virus free plants are developed using -------- culture.

(iii) The plant hormone which control fruit ripening is ----------.

(iv) The enzymes required for obtaining protoplasts are cellulose and ----------.

(v) --------- formation is the main effect of cytokines in the tissue culture system.

(b) Multiple choice questions :

(vi) Restriction endonucleases are used in genetic engineering, because :

(a) They can degrade harmful proteins

(b) They can join DNA fragments

(c) They can cut DNA at specific base sequences

(d) They can cut DNA at variable sites

(vii) Somatic hybridization is achieved through :

(a) Grafting

(b) Protoplast fusion

(c) Conjugation

(d) Recombinant DNA technology

(viii) Protoplasts are the cells devoid of :

(a) Cell membrane

(b) Cell wall

(c) Both cell wall and cell membrane

(d) None of these

(ix) The phenomenon of the reversion of mature cells to the meristematic state leading to the formation of callus is known as :

(a) Redifferentiation

(b) Dedifferentiation

(c) Either (a) or (b)

(d) None of these

(x) Cellular totipotency is the property of :

(a) Plants

(b) Animals

(c) Bacteria

(d) All of these

(xi) *Agrobacterium* based gene transfer is efficient :

(a) Only with dicots

(b) Only with monocots

(c) With both monocots and dicots

(d) With majority monocots and few dicot

(xii) Micro-projectile method of gene transfer in plants involves delivery of DNA.

(a) With the help of micromanipulator

(b) With the help of bolistics

(c) With the help of needles

(d) All of these

Section-B

(Very Short Answer Type Questions)

Note : Attempt **any five** questions in **25-30** words each. Each question carries **2** marks. [5x2=10]

2. (a) Define cytodifferentiation.

(b) What are double haploids ?

(c) Define Probe.

(d) Name any two enzymes involved in genetic modification.

(e) What are transgenes ?

(f) Which bacterial strain carries Ri plasmid ?

(g) What is Cry1Ac ?

Section-C

(Short Answer Type Questions)

Note : Attempt **any five** questions in **250** words each. Each question carries **4** marks. [5x4=20]

3. (a) Explain how artificial seeds are produced.

(b) Write name and functions of macronutrients used in plant tissue culture media ?

(c) Write two method of protoplast fusion.

(d) Explain how somaclonal variants are created.

(e) Explain method and application of Southern blotting.

(f) How siRNA technology is useful in development of virus resistance plant.

(g) What is Biopharming ? How it is produced ?

Section-D

(Essay Type Questions)

Note : Attempt **any three** questions in **500-700** words each. Each question carries **10** marks. [3x10=30]

4. (a) Explain method and application of suspension culture in detail.

(b) Explain how industrial and therapeutic proteins are produced.

(c) Write a note on method and application of somatic hybridization.

(d) Explain *Agrobacterium* mediated gene transformation techniques in detail.

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