M.Sc. (BIOTECHNOLOGY) SEMESTER II
ONLINE EXAMINATION, AUGUST 2021
PAPER CODE – MBT-CC203

PAPER TITLE: PLANT TISSUE CULTURE AND ITS APPLICATIONS

Time: Three Hours *Maximum Marks: 75*

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Question No. 1.

A. Define the following: **[2 x 5 = 10]**

i) Totipotency
ii) Plant regeneration
iii) Androgenesis
iv) Dedifferentiation
v) Vitrification

B. Write your answers in *one or two words* for the following: [1 x 5 = 5]

i) _____medium is the most suitable for culturing woody plants.
ii) Rapid clonal propagation of elite plants is known as_____.
iii) *In vitro* preservation of plant genetic resources under ultra-low temperature is called as_____.
iv) Enzymatic isolation of plant protoplasts was developed by_____.
v) Bioreactors are used to produce_____at the large scale.

Question No. 2.

Attempt any *three* of the following: **[5 x 3 = 15]**

a) What is meant by embryo rescue? Add the applications of embryo rescue in agriculture.
b) Write a short note on Arabidopsis floral development.
c) Describe the tissue culture technique, which is used to develop triploid plants.
d) What are the different stages of micropropagation?
e) Describe the molecular technique which is commonly used to demonstrate the clonal fidelity of regenerants.

Question No. 3.

Attempt any *two* of the following: **[7.5 x 2 = 15]**

a) What is meant by somaclonal variation? Describe the applications of somaclonal variation for crop improvement.
b) Write a short note on the use of plant tissue culture technology for the selection of salt and drought tolerant plants.
c) Describe the procedure to develop disease and insect pest resistant plants using plant tissue culture technology.
d) What are synthetic seeds? How are they prepared? Mention its applications.

Question No. 4.

Attempt any *two* of the following: **[7.5 x 2 = 15]**

a) What is Electroporation? Give advantages and disadvantages of the technique.
b) Write a short note on the applications of somatic hybrids and cybrids in agriculture.
c) Discuss in detail about the genetic transformation by microprojectile bombardment.

Question No. 5.

A. Distinguish between any *two* of the following: **[5 x 2 = 10]**

a) Batch culture and Continuous culture
b) Organogenesis and Somatic embryogenesis
c) Juvenile and mature explant.
d) MS and WB medium.

B. Give an important contribution of the following scientist: **[5]**

G. Haberlandt, PR White, J van Overbeek, P. Maheswari and L. Knudson.

It should be noted that 60 minutes extra time will be provided to scan your answer sheets, build a PDF and upload it to
biotechnologyexam2020@gmail.com
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