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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Biotechnology **Duration: 3 hrs.**
Course Code: 19BT5DE2AGT **Max Marks: 100**
Course: Agricultural Biotechnology **Date: 23.02.2023**

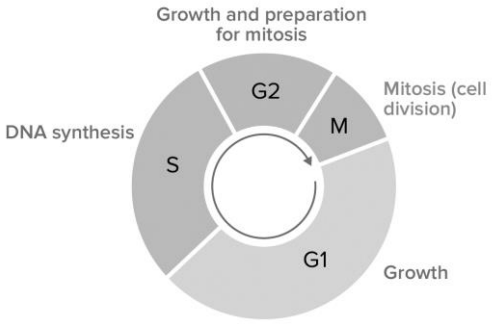
Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1 a) Differentiate between the following **06**
1. Somaclonal and Gametoclonal variation
2. Cybridization and somatic hybridization

b) *Catharanthus roseus* is well known for anti-cancerous product vincristine and vinblastine, but the concentration of these metabolites produced in *invitro* culture is challenging. Suggest atleast 3 strategies a researcher can follow to enhance their production in Tissue cultured plants **10**

c) Following is the image of typical cell cycle. List the protein expressed during each of the phases **04**



UNIT - II

2 a) There are various molecular techniques for analyzing the presence of transgenes in the target crop. Discuss the statement with respect to following **10**
a. Technique which shows the presence or absence of transgenes.
b. Technique which is used to study copy number of transgenes.

b) With emphasis on EPSPS pathway, discuss how herbicide resistance can be developed in Maize crops. **05**

c) Discuss on the current status and biosafety norms for plant transgenics/GMOs. **05**

OR

3 a) Ethylene and polygalacturonase are two key components that regulate the flavor as well as shelf life of fruits. Justify the statement with suitable case study. **06**

b) *Agrobacterium tumefaciens* is one of the most economical and efficient way of transferring gene of interest in the target crop. Substantiate the statement with examples. **06**

c) The control of insects and pathogen such as viruses and bacteria effecting crops follow distinct mechanism. Deliberate on the statement with example in each. **08**

UNIT - III

4 a) Few association between plant and microbes are useful in terms of plant growth. Justify the statement with case studies. **10**

b) Discuss the role of bio -fertilizers. How do they contribute towards safety of the environment and security of foods? **10**

OR

5 a) Subunit vaccines are made in crops to express the corrective gene encoding a protein for specific disease. With suitable case study justify the statement. **10**

b) Discuss on the following with emphasis on their role in environment **10**

1) Biopolymer
2) Biofuels

UNIT - IV

6 a) What are the different production functions involved in agriculture? Enumerate with suitable mathematical relationships. **10**

b) Brief on the importance of agricultural economics. With numerical representation explain linear programming in detail. **10**

UNIT - V

7 a) An agriculturist would like to establish a farm business organization. Elaborate on the economic principles that could be applied for the success of organization. **10**

b) Which principle applies factor-factor relationship? Add a note on the significance of factor-product relationship. **10**

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