

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: MSC
BRANCH: BIOTECHNOLOGY**

**SEMESTER : III
SESSION : MO/18**

SUBJECT: SBT3007 PLANT BIOTECHNOLOGY

TIME: 3 HOURS

FULL MARKS: 60

INSTRUCTIONS:

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
 2. Candidates may attempt any 5 questions maximum of 60 marks.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) Define cellular totipotency. Explain the role of micro and macro nutrients in plant tissue culture. [6]
Q.1(b) How will you sterilize the nodal explant for explantation? List out four applications of plant tissue culture. [6]
- Q.2(a) What do you understand by somatic embryogenesis? How does it differ from organogenesis? [6]
Q.2(b) Differentiate between somatic embryos and zygotic embryos. Give a protocol for artificial seeds production. [6]
- Q.3(a) Define Biotransformation and mention its advantages. What are the prerequisites for a successful and viable process of biotransformation? [6]
Q.3(b) What are the methods for conservation of germplasm? Compare in situ and ex situ preservation. List out the steps involved in cryopreservation. [6]
- Q.4(a) Discuss the method for protoplast purification with diagram. List out different protoplast culture techniques. [6]
Q.4(b) Discuss the steps involved in somatic hybridization. What are cytoplasmic hybrids? What are the advantages of cybrid production? [6]
- Q.5(a) What are the pre and post fertilization barriers? Discuss. What is embryo rescue? [6]
Q.5(b) What do you understand by haploid production? Describe anther culture and mention the advantages of haploid production. Include necessary diagrams. [6]
- Q.6(a) Discuss the role of MAPKs in stress tolerance. Discuss the strategy involved for molecular farming and give four reasons why plant system is considered more suitable than bacterial cell as a expression host. [6]
Q.6(b) Give an account of Chloroplast transformation. Mention about Chloroplast expression vector including necessary diagrams. [6]
- Q.7(a) Give an outline of classification of Molecular markers. List out six uses of molecular markers. [6]
Q.7(b) Discuss about SSR / AFLP marker and mention its advantages. [6]

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