



DII-003-013406

Seat No. _____

M. Sc. (Sem. IV) (CBCS) Examination

May / June – 2015

Biotechnology : BT - 424

(Agriculture Biotechnology) (Elective)

Faculty Code : 003

Subject Code : 013406

Time : 3 Hours]

[Total Marks : 70

1. Multiple Choice question -Attempt any Seven out of ten [7x2]

- i. Which group of plants has the greatest diversity (i.e. the most species) living today?
 - a. Bryophyta
 - b. Lycophyta
 - c. Gymnosperms
 - d. Angiosperms

- ii. Auxanometer is used for measuring
 - a. respiratory activity
 - b. photosynthetic activity
 - c. growth activity
 - d. osmotic pressure

- iii. In angiosperm, the endosperm is
 - a. haploid
 - b. diploid
 - c. triploid
 - d. none of these

- iv. Which of the following metabolites are implicated in stress tolerance?
 - a. Proline
 - b. Betaines
 - c. Both (a) and (b)
 - d. Citrate

- v. Plants containing genes encoding cytokines and blood clotting factors are used in
 - a. nutrition improvement.
 - b. pharmaceutical production
 - c. vaccine production.
 - d. textile production.

- vi. The first transgenic plants expressing engineered foreign genes were tobacco plants produced by the use of -
 - a. *Agrobacterium tumefaciens*
 - b. *Bacillus thuringiensis*
 - c. *Arabidopsis thaliana*
 - d. *Streptomyces hygroscopicus*

- vii. Which of the following dies from Ti plasmid infection?
 - a. Rice
 - b. Corn
 - c. Sorghum
 - d. All of these

- viii. Which of the following genes can be used for making resistances against viral infection
- Genes for capsid protein
 - Gene for nucleocapsid protein
 - Satellite RNA
 - All of these
- ix.. Which of the following compounds has been produced in transgenic plants to improve tolerance to salt stress and water deficit?
- Sucrose
 - Mannitol
 - Nicotine
 - Octopine
- x. Which of the following is not a characteristic of a transgenic crop?
- herbicide resistance.
 - Bt insect resistance toxin.
 - increased methionine content
 - none of these

2 Attempt any two out of three –

[7x2]

- What are the subkingdoms into which the plant kingdom is divided?
- What is plant transpiration? What are the main types of plant transpiration process? How do plants control the opening and the closing of the stomata?
- Describe different type of plant growth regulators and their functional role in plant tissue culture?

3. Answer any two out of three-

[7x2]

- What do you understand by abiotic stress, discuss various abiotic stresses and their effect on plants.
- There is great success for transgenic plant production for biotic stress, however there is a lacuna which needs to be unplugged for abiotic stress, justify with example
- How many environmental factors can limit photosynthesis at one time? Explain the concept of limiting factor using as an example conditions under which photosynthesis is light-limited or CO₂-limited.

4. Answer the following-

[7x2]

- Give a detailed note on plant transformation vectors.
- Discuss how plants can be used as bioreactors for the production of foreign proteins

OR

4. Answer the following -

[7x2]

- Give a detailed outline of plant transformation technology and describe different methods.
- Describe about the strategies employed for genetically engineered plants for herbicide resistance

5. Answer any two out of four-

[7x2]

- A decrease or cessation of leaf expansion is an early response to water stress. Provide a mechanism for this response.
- Give an account of the genetic engineering of plants for production of industrial enzymes
- “Agrobacterium is nature’s way of genetic transformation” explain.
- What are heat shock proteins? Do they provide thermotolerance? How is the synthesis of heat shock proteins regulated?