

Sardar Patel University
Fifth semester examination-2013
Subject-Biotechnology (Title--Plant Biotechnology)
Course-US05CBIT03 (3 credit course)

Time 10.30am--1.30pm

Date: 18/11/13: Monday

Total Marks-70

Q1 Multiple choice questions

[10]

- i) **ACC deaminase gene is responsible for**
 A. synthesis for ethylene
 B. degradation of ACC an immediate precursor to ethylene
 C. both (A) and (B)
 D. synthesis of polygalactouranase
- ii) **Electroporation technique is used efficiently in plant using:**
 A. callus
 B. protoplast
 C. leaf disc
 D. whole plant
- iii) **EPSPS is competitively inhibited by**
 A. glufosinate C. bialaphos
 B. glyphosate D. phosphoenolpyruvate
- iv) **Biolistic technique is used in**
 A. Tissue culture process B. Gene transfer process
 C. Hybridization process D. Germplasm conservation process
- v) **Which one of the following bacterium is used for production of transgenic plants?**
 A. *Escherichia coli* B. *Bacillus thuringiensis*
 C. *Staphylococcus aureus* D. *Agrobacterium tumefaciens*
- vi) **Dimethyl sulfoxide (DMSO) is used as**
 (A) Cryopreservant (C) Sterilant
 (B) Cryoprotectant (D) A) and C) both
 (C)
- vii) **Hormone pairs required for a callus to differentiate are**
 (A) Auxin and cytokinin (C) Auxin and gibberellin
 (B) Ethylene and gibberellin (D) Cytokinin and gibberellin
- viii) **The gene not used for construction of Golden rice is**
 A. Phytoene synthase C. LycopeneB cyclase
 B. Ferritin gene D. Phytoene desterase
- ix) **In micropropagation stage 4 (four) represents**
 A. Preparatory C. Rooting
 B. Multiplication D. Hardening
- x) **Which of the following hormone is a sesquiterpene**
 A. Auxin C. Ethylene
 B. Cytokinin D. ABA

Q2. Short questions –attempt any 10 out of 12 questions, each carry 2 marks [20]

- i. Enlist the genes required to make Flavr savr tomato.
- ii. What property gave the name golden to golden rice explain.
- iii. Explain the term microinjection.
- iv. Define selectable markers and scorable markers.
- v. Define cryopreservant and cryoprotectant with one example of each.
- vi. Enlist the significance of micropropagation.
- vii. Give the examples of any two bioactive compounds with their source of production.
- viii. Enlist the characteristic features and types of phytohormones.
- ix. Explain the role of auxin in phototropism.
- x. Define somaclonal variations. Enlist the causes of such variations.
- xi. Define artificial seeds. Give their significance.
- xii. Give the advantages of hairy root culture.

Q3a Describe chemical methods of gene transfer in plants and their significance. [07]

Q3b Draw the labeled diagram of Tumor inducing plasmid. [03]

OR

Q3 Discuss in detail the types and function of genes involved during T-DNA transfer to plant cells. [10]

Q4. Discuss the making of golden rice and its properties. [10]

OR

Q4 Explain the role of various genes involved in making transgenic tomato for longer shelf life. Discuss antisense RNA technology in making flavr savr tomato. [6+4]

Q5 Explain the roles of auxin and ethylene in plants. [6+4]

OR

Q5 Discuss cryopreservation and factors affecting it. Give its merits and demerits. [10]

Q6a Define secondary metabolites. Explain the role of tissue culture in its production. [06]

Q6b Describe the production of antitumor compounds from plants. [04]

OR

Q6 Describe the molecular basis of somaclonal variations. [10]

—x—x—