

(A-10) Seat No: _____ **SARDAR PATEL UNIVERSITY**
M.Sc. (Integrated) Biotechnology
Environmental Biotechnology – Ninth Semester Examination
Monday 17th October, 2016
10:00 a.m. to 1:00 p.m.
PS09CIGEB1: Green Biotechnology

Total Marks: 70

- Note: (1) Figures to the right indicate marks.
 (2) Draw a neat and labeled diagram, wherever necessary.

Q. 1 Choose the most appropriate answer from the four alternatives given: [08]

- (i). The characteristics feature of VAM is it penetrate plant cell wall and form.....
 (a) spores intracellularly
 (b) vesicles and dichotomously branched invaginations arbuscles
 (c) haustoria
 (d) none of these
- (ii). Free Anabaena, a nitrogen fixer is present in the root pockets of.....
 (a) *Marselia* (b) *Salvinia*
 (c) *Pistia* (d) *Azolla*
- (iii). pathogen converts its host in to mummy.
 (a) *Beauveria. bassiana* (b) *Trichoderma viridea*
 (c) *Aspergillus niger* (d) *Fusarium oxysporum*
- (iv). Monomer of PHB is produced from primary precursor metabolite.
 (a) acetate (b) acetate phosphate (c) acetyl coA (d) pyruvate
- (v). Following is the correct order of binding with strong affinity to low affinity with clay particles for metals i) Al^{3+} ii) Ca^{2+} iii) K^+ iv) Na^+
 (a) i > ii > iii > iv (b) ii > i > iii > iv (c) iv > iii > ii > i (d) iii > ii > iv > i
- (vi). Which of the following is not an Enhanced Oil Recovery (EOR) technique?
 (a) chemical flooding (b) thermal recovery (c) water flooding (d) microbial recovery
- (vii). Trade secret in the area of biotechnology may include.....
 (a) cell line (b) gene transfer method
 (c) both (a) and (b) (d) none of them
- (viii). Transgenic tomato "Flavr Savr" is well known for
 (a) delayed ripening (b) size
 (c) colour (d) all of these

PTO.

Q.2 Answer any SEVEN from the following:

[14]

- (i) What are biofertilizer? Write its role in crop improvement program.
 - (ii) Write a short note on *Rizobium* as a source of biofertilizer.
 - (iii) Enlist various benefits of mycorrhiza as a biofertilizer.
 - (iv) Briefly explain the driving forces of IPM.
 - (v) Briefly write about the production of NPV.
 - (vi) Schematically present metal uptake mechanisms by cell.
 - (vii) What is acid mine drainage?
 - (viii) Write a short note on benefits of transgenic crops in crop improvement program.
 - (ix) What do you mean by intellectual property protection of transgenic plants?
- Q.3 (a) Write a detail note on plant growth promoting rhizobacteria as a biofertilizer.

[6]

- (b) Give a detailed account on aerobic and anaerobic biofertilizers.

[6]

OR

- (b) Discuss in detail about classification of biofertilizers and its applications in India.

[6]

- Q.4 (a) Enlist various toxins produced by *Bacillus thurengensis*. Describe in detail about the mode of action and production of *B. thurengensis*. [6]
- (b) What is integrated pest management? Write a detailed note on IPM for crop management. [6]

OR

- (b) Enlist various biopolymers. Discuss production of PLA using microorganisms.

[6]

- Q.5 (a) Explain the metal dependant resistance mechanism with *mer* operon.

[6]

- (b) Explain the role of *Thiobacillus ferroxidanse* in leaching of metal.

[6]

OR

- (b) Why desulphurization of fuel is required? Write the consequences of higher sulphur content in fuel and narrate remedies adopted to achieve desulphurization of fuel. [6]

- Q.6 (a) What do you mean by transgenic plants? How integration and expression of alien genes carried out for transgenic plants. [6]

- (b) Give a detail account on production of transgenic banana and mango. [6]

[6]

OR

- (b) Explain in detail about cell culture regeneration program for transgenic plants. [6]

[6]

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