1511E1240

M.Sc. Sem.-3 Examination

503

Bio-Technology

November-2025

Candidate's Seat No :_____

Time : 2-30 Hours] [Max. Marks : 70

Q.1 Answer the following

Write a note on algae and significance for biofuel production 14

or

(a) Discuss the first, second and third generation of biofuels with examples 7

(b) Discuss the concept of biorefinery with a suitable example. 7

Q.2 Answer the following

Describe the role of microorganisms in generating acid mine drainage. Discuss in detail the techniques used for its prevention and control. 14

or

(a) Discuss the mechanism involved in the bioleaching of metals from sulfidic minerals. 7

(b)What is biobeneficiation? Explain mechanisms and microorganisms involved in biobeneficiation with suitable examples 7

Q.3 Answer the following

Describe the different microbial mechanisms of metal resistance and detoxification. Discuss any one mechanism in detail. 14

or

(a) Explain the role of Polyphosphates and Metallothionine in microbial detoxification of heavy metals with suitable examples. 7

(b) Define phytoremediation and briefly explain the different processes plants use for remediation. 7

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Q.4 Answer the following

Enlist the group of marine enzymes and briefly describe the enzyme amylase along with its source, production strategies and applications using suitable examples. 14

or

(a) List out marine-derived therapeutics: sources, mode of action and applications 7

(b) Define marine bioprospecting. Discuss its importance in modern biotechnology? 7

Q.5 Answer the following(Any Seven) 14

(a) Give composition of Biogas

(b) What is Biodiesel

(c) Draw a photocell

(d) What is the major difference between bioleaching and biooxidation?

(e) What is galvanic interaction?

(f) Define – chemolithoautotropy

(g) What is the function of siderophores in microbial metal resistance?

(h) Which enzymes are responsible for mercury detoxification in bacteria?

(i) What does the abbreviation *czc* gene cluster stand for?

(j) For what is Conotoxin used for?

(k) Name any two marine-derived compounds used as anticancer agents.

(l) List out the properties of Marine cosmeceuticals