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S. No. of Question Paper : 1362

Unique Paper Code : 2531504

F-7

Name of the Paper : Environmental Microbiology

Name of the Course : B.Sc. (H) Microbiology (Erstwhile FYUP)

Semester : V

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any five questions.

All questions carry equal marks.

1. (a) Define the following (any seven) :

(i) Food chain

(ii) Habitat

(iii) Rhizosphere

(iv) Neuston

(v) Pre-emptive colonization

(vi) Benthos

(vii) Allocthonous microbes

(viii) Co-metabolism.

2×7=14

(b) Give an example of a stem nodulating bacteria.

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P.T.O.

2. (a) Differentiate between the following (any three) : 4×3=12
- (i) Lentic and lotic habitats
 - (ii) Autogenic and allogenic successions
 - (iii) Ectomycorrhiza and endomycorrhiza
 - (iv) Nitrification and denitrification.
- (b) Enlist the characters favouring survival of microorganisms in atmosphere. 3
3. (a) Discuss synergism or symbiosis with a suitable example. 5
- (b) How does BOD differ from COD ? 4
- (c) Why is remen described as anaerobic continuous fermentor ? 3
- (d) Write a short note on siderophores. 3
4. (a) Give the ecological significance of the following microbes (any six) : 2×6=12
- (i) *Frankia*
 - (ii) *Arthrobotrys*
 - (iii) *Azotobacter*
 - (iv) *Sphaerotilus natans*
 - (v) *Phanerochaete chrysosporium*
 - (vi) *Vibrio fischeri*
 - (vii) *Thiobacillus ferroxidans*
- (b) How is trickling filter method or septic tank helpful in sewage treatment ? 3

5. Answer the following questions (any *five*) :

3×5=15

- (i) Why is a lignin molecule resistant to biodegradation ?
- (ii) Diagrammatically show the various soil horizons in a soil profile.
- (iii) What is amensalism ? Explain with the help of a suitable example.
- (iv) What are the advantages of activated sludge process ?
- (v) How do microbes contribute to solubilization of inorganic phosphates ?
- (vi) Discuss the main features of marine bacteria.

6. (a) State *True* or *False* and justify (any *six*) :

- (i) Positive interaction predominate at high population densities.
- (ii) Primary sewage treatment is a biologically mediated process.
- (iii) Plant roots have a direct influence on density of soil microflora.
- (iv) Neutralism is favoured by environmental, conditions that permit active growth.
- (v) Hemicelluloses have structural relationship to cellulose.
- (vi) Compositing can be accomplished rapidly using a bioreactor.
- (vii) Soil is a hostile environment for the proliferation of microbes.
- (viii) Both free living and symbiotic bacteria contribute to nitrogen fixation. 2×6=12

(b) Diagrammatically depict biodegradation of 2, 4-D.

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