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Your Roll No.....

5842

**B.Sc. (Hons.) Botany/I Sem.**

**B**

Paper—BTHT-101 : BIODIVERSITY-I

(Algae and Microbiology)

Time : 3 Hours

Maximum Marks : 75

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

Sections A and B should be answered on separate sheets. All parts of a question must be attempted together. Illustrate your answers with suitable diagrams wherever necessary.

**Section A**

Attempt *four* questions in all from this Section

including Q. No. I which is compulsory.

I. (a) Fill in the blanks of any *five* of the following : 5

(i) False branching is seen in the Division.....

(ii) Floridean starch is the reserve food material of the

Division.....

P.T.O.

- (iii) External fertilization is seen in the genus  
.....
- (iv) The colony of *Volvox* having a definite number  
of cells arranged in a specific manner is called  
.....
- (v) The members of the Division.....are  
used in the rice fields as manure.
- (vi) *Prochloron* belongs to the Division.....
- (b) Indicate which of the following statements are true or  
false (any four) : 4
- (i) The spermatia in Rhodophyta are non-motile.
- (ii) Red sea is caused by red algae.
- (iii) Flagella in the Division Phaeophyta are heterokont.
- (iv) Carboxysomes perform the function of nitrogen  
fixation.

(v) The reproductive structures in algae are covered by a protective sterile jacket.

(c) Match the items of column A with those of column B :

Column A	Column B
<i>Chara</i>	Tetraspore
Gas vesicle	<i>Vaucheria</i>
Coenocytic thallus	<i>Fucus</i>
Fucoserraten	Amylum star
<i>Polysiphonia</i>	<i>Cyanophyta</i>

2. Write short notes on any *three* of the following : 3×4=12

- (i) Pseudovacuole;
- (ii) Nucule of *Chara*;
- (iii) Asexual reproduction in *Volvox*;
- (iv) Plurilocular sporangium.

3. Differentiate between any *four* of the following giving suitable examples wherever necessary :  $4 \times 3 = 12$

(i) Zoospore and androspore in *Oedogonium*;

(ii) Spermocarp and Cystocarp;

(iii) Isogamy and Oogamy;

(iv) Unistipulatae and bistipulatae condition;

(v) Oospore and Oosphere.

4. (a) Draw well-labelled diagrams of any *two* of the following :  $2 \times 3 = 6$

(i) V.S. female conceptacle of *Fucus*;

(ii) E.M. Cyanophycean cell;

(iii) Antheridium and Oogonium of *Vaucheria*.

(b) Comment on the evolution of sex in *Chlamydomonas*. 6

5. (a) Discuss briefly the role of algae in industry. 5

(b) Give an account of the reserve food material of the various classes of algae studied by you. 5

- (c) Write *two* important contributions of any *one* of the following : 2

(i) R.E. Lee;

(ii) F.E. Fritsch.

### Section B

Attempt *three* questions in all from this

Section including Q. No. 6 which is compulsory.

6. (a) Fill in the blanks of any *nine* of the following : 9

(i) Central Food Technological Research Institute is situated at.....

(ii) Channel-containing proteins that span the outer membrane of Gram-negative bacteria are called.....

(iii) Tricarboxylic acid cycle is an.....pathway.

- (iv) The bacterium.....has a membrane bound nucleoid region.
- (v) Retroviruses use.....enzyme to synthesize a DNA copy of their RNA genome.
- (vi) The salt tolerant bacterium.....occurs in the Dead Sea and the Great Salt Lake.
- (vii) The process by which plasmids can be eliminated from the host cells is called.....
- (viii) Citrus canker is caused by.....
- (ix) Viruses which do not cause lysis of bacterial cells are called.....bacteriophage.
- (x) .....enzyme catalyzes the insertion or integration of Lambda genome in *E.coli* chromosome.

(xi) Anaerobes also produce energy by reactions called....., which use organic compounds as electron donors and acceptors.

(b) Give *one* word for : 4

(i) An organism that uses organic compounds as a source of electrons.

(ii) The time interval necessary for a cell to divide.

(iii) A member of a group of bacteria lacking cell walls.

(iv) The movement of an organism in response to a chemical stimulus.

7. Write short notes on any *three* of the following :  $3 \times 2 = 6$

(i) Bacteriophage;

(ii) Pour-plate method;

(iii) Selective media;

(iv) Biofilms;

(v) Microbial growth curve.

8. Differentiate between any *two* : 2×3=6
- (i) Generalized transduction and Specialized transduction;
  - (ii) Batch culture and Continuous culture;
  - (iii) Virion and Viroid.
9. (a) Describe the process of replication in viruses. 3
- (b) Comment on the economic importance of bacteria. 3