UNIQUE PAPER CODE: 216101

NAME OF THE PAPER: Paper BTHT-101 : Biodiversity-I (Algae & Microbiology)

NAME OF THE COURSE: B.Sc.(Hons.) BOTANY

SEMESTER: I

DURATION: 3 Hours

MAXIMUM MARKS: 75

INSTRUCTION FOR CANDIDATES:

- 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 Question no.1, which is compulsory

1. (a) Fill in the blanks:

     i.   _____coined the term 'Algae'.
     ii.   _____causes Red Snow.
     iii.   Slime algae can withstand long periods of _____.
     iv.   Macrandrous filaments are found in _____.
     v.   Absence of _____in the life-cycle is a common feature between Cyanophyceae and Rhodophyceae.
     vi.   _____causes Red Rust of tea.
     vii.   *Ectocarpus* exhibits _____habit.
     viii.   *Nostoc* occurs as an endophyte in _____.
     ix.   _____is a green alga with distinct nodes and internodes.
     x.   Receptacle of *Fucus* bears _____.   1/2×10=5 marks

(b) Give generic name of an alga studied by you that has the following:

     i.   Palmella stage
     ii.   Carpospore   .
     iii.   Gongrosira stage
     iv.   Daughter colony
     v.   Nucule
     vi.   Plurilocular sporangium
     vii.   Synzoospore

viii. Cap cells
ix. Spermocarp
x. Plakea stage   1/2×10=5 marks

(c) Indicate which of the following statements is True or False?

    i.   *Ectocarpus* exhibits apical growth.
    ii. *Polysiphonia* has pit-connections in the thallus.
    iii. *Coleochaete* is not a brown alga.
    iv. Oogonial wall of *Fucus* is two-layered.   1×4=4 marks

2. Write short notes on (any THREE) of the following:

    a) Criteria for classification of algae
    b) Life-cycle of *Polysiphonia*
    c) Phycocolloids
    d) Reproduction in *Nostoc*   4×3=12 marks

3. (a) Give well-labelled diagrams for any THREE of the following:

    i.   Sex-organs in *Vaucheria*
    ii. E.M Heterocyst of *Nostoc*
    iii. Nucule of *Chara*
    iv. External morphology of *Fucus*   2×3=6 marks

(b) Discuss the affinities of *Vaucheria* and mention its taxonomic position.   3 marks

(c) Mention major contributions of any THREE of the following:

    i. F.E.Fritsch
    ii. H.D.Kumar
    iii. G.M.Smith
    iv. R.N.Singh   1×3=3 marks

4. Differentiate between any FOUR of the following:

    a) Gongrosira stage and Palmella stage
    b) Cystocarp and Spermocarp
    c) Isogamy and Oogamy
    d) Heterocyst and Vegetative cell of *Nostoc*
    e) Unilocular sporangium and Plurilocular sporangium   3×4=12 marks

5. Describe, with the help of labelled diagrams, any THREE of the following:

    a) Female Conceptacle of *Fucus*
    b) Development of Synzoospore in *Vaucheria*
    c) Fine structure of *Prochloron*
    d) Daughter colony formation in *Volvox*   4×3=12 marks

Attempt FOUR questions in all from this section,

including Question no.6, which is compulsory

Question 6. (a) Fill in the blanks :   ½ x 8 = 4

    (i)   Viral particles occurring in nature without capsid are _____.

    (ii)   Bacterium type with flagella present all around is called _____.

    (iii)   A characteristic constituent of the wall of Gram +ve bacterium is

          _____.

    (iv)   National Institute of Virology is located at _____.

    (v)   The extrachromosomal DNA in bacterium is known as _____.

    (vi) T_2-coliphage has _____ type of symmetry.

    (vii)   Citrus-canker is caused by _____.

    (viii) Certain bacteria develop an extremely-resistant form called _____.

(b) Answer as to whether the given statement is *true* or *false* :

                                                        1 x 4 = 4

    (i)   In TMV, 2130 identical capsomeres are arranged in a helix.

    (ii)   CFTRI is located at Mumbai (Maharashtra).

    (iii)   In Transduction, the viral genome when integrated with the bacterial genome is known as prophage.

    (iv)   Characteristic pigment associated with symbiotic nitrogen-fixation in legumes is leghaemoglobin.

(c) Give important scientific contributions of the following: 1 x 2 = 2

    (i)   J. Lederberg and E. Tatum

    (ii)   W. M. Stanley

Question 7. Differentiate between *any two* of the following: 2 ½ x 2 = 5

    a) Archaebacteria and Eubacteria

    b) Prokaryote and Eukaryote

    c) L-form and Mycoplasma

Question 8. Write short notes on *any two* of the following: 2 ½ x 2 = 5

    a) Microbial growth curve

    b) Economic importance of bacteria

    c) Bacteriophage and Retrovirus

Question 9. Draw labelled diagrams of *any two* of the following: 2 ½ x 2 = 5

       a) Electron micrograph of bacterial cell
       b) TMV
       c) Electron micrograph of a T_2 Coliphage

Question 10. Comment on *any two* of the following :   2 ½ x 2 = 5

       a) It is debatable as to whether the viruses are living or non-living !
       b) Conjugation and Transduction (with diagrams).
       c) Methods of isolation of microbes: any one microbe in detail.