

MICRON CLASSES
1ST SEMESTER EXAMINATION — 2026
Subject: Botany / Microbiology (Paper: Algae)

Time Allowed: 2 Hours

Course Code: MIC101

Full Marks: 40

General Instructions: Answer questions from all sections as per given instructions. Figures in the right-hand margin indicate full marks for each question/sub-part.

SECTION A (Very Short Answer Questions)

Total Marks: 10

- 1. Answer any SIX of the following questions (1 mark each):** **[6 × 1 = 6]**
- (a) Name the primary reserve food material stored in Chlorophyceae. **[1]**
 - (b) What is the specific physiological function of the eyespot (stigma) in motile algal cells? **[1]**
 - (c) Define the term *thallus* with reference to algal body organization. **[1]**
 - (d) Which major photosynthetic pigment gives brown algae (Phaeophyceae) their characteristic color? **[1]**
 - (e) Name one specific algal genus that exhibits a typical Haplontic life cycle. **[1]**
 - (f) Which group of algae is commonly utilized as biofertilizer in agricultural field crops? **[1]**
 - (g) Name the structural chemical present in the cell wall of diatoms. **[1]**
- 2. Answer any TWO of the following questions (2 marks each):** **[2 × 2 = 4]**
- (a) Differentiate between whiplash and tinsel flagella found in algal cells with respect to structure. **[2]**
 - (b) State two important applications of algae in environmental pollution control and management. **[2]**
 - (c) Briefly explain the main difference between isomorphic and heteromorphic life cycle pattern. **[2]**

SECTION B (Short Answer Questions)

Total Marks: 15

Answer ALL five questions (3 marks each).

- Q3.** Classify the major photosynthetic pigments in algae and highlight their role in light absorption. **[3]**
- Q4.** Explain the economic importance of algae as direct human food and in Single-Cell Protein (SCP) production. **[3]**
- Q5.** Describe three distinct modes of vegetative reproduction found across different groups of algae. **[3]**
- Q6.** Briefly outline the cellular structure of algal flagella and describe their arrangement types. **[3]**
- Q7.** Explain the characteristic features of a **Haplobiontic** life cycle in algae using a labeled flowchart. **[3]**

SECTION C (Medium Long Answer Questions)**Total Marks: 5**

Answer ANY ONE question (Question 8 OR Question 9).

Q8. Answer the following sub-parts:

- (a) Provide a concise account of the diversity in thallus organization in green algae. [3]
- (b) State two major applications of algae as soil conditioners and bio-fertilizers in agricultural fields. [2]

— OR —

Q9. Answer the following sub-parts:

- (a) Compare and contrast the **Haplontic** and **Diplontic** life cycles in algae with appropriate schematic diagrams and examples. [4]
- (b) Name the specific reserve food material and major photosynthetic pigment found in Rhodophyceae. [1]

SECTION D (Comprehensive Long Answer Question)**Total Marks: 10**

Answer ANY ONE question (Question 10 OR Question 11).

Q10. Answer the following sub-parts:

- (a) Provide a detailed account of the **Diplobiontic** life cycle pattern in algae. Include suitable examples, alternating generations, and draw a neat, labeled lifecycle diagram. [8]
- (b) Discuss the application of microalgae in wastewater treatment and heavy metal bioremediation. [2]

— OR —

Q11. Answer the following sub-parts:

- (a) Describe in detail the various modes of sexual reproduction in algae (Isogamy, Anisogamy, and Oogamy) with evolutionary significance and suitable examples. [5]
- (b) Elaborate on the economic applications of algae across agriculture (bio-fertilizers), environmental monitoring, and food industries. [5]