Please read each of the following instructions carefully before attempting questions:

There are EIGHT questions in all, out of which FIVE are to be attempted.

Questions no. 1 and 5 are compulsory. Out of the remaining SIX questions, THREE are to be attempted selecting at least ONE question from each of the two Sections A and B.

Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

All questions carry equal marks. The number of marks carried by a question/part is indicated against it.

Answers must be written in ENGLISH only.

Neat sketches may be drawn, wherever required.

SECTION A

Q1. Answer the following keeping your answers brief and to the point. 8×5=40

(a) Distinguish between Bacteria and Archaea. 8

(b) Comment on why *Albugo candida* and *Phytophthora infestans* are not considered as fungi. 8

(c) Distinguish between Chlorophyta and Rhodophyta. 8

(d) What is Peristome? Describe its formation and role. 2+6=8

(e) What are coralloid roots? Where are these found and what important role do they play? 4+1+3=8
Q2. (a) Compare loose smut with covered smut of wheat plants on the basis of symptoms, casual organism, disease cycle and disease management. $5+5+5=15$

(b) Describe the evolutionary significance of various stellar structures found in Pteridophytes. Give one suitable example in each case. $10+5=15$

(c) Describe the diversity of photosynthetic pigments found in the major classes of Algae. $10$

Q3. (a) What are the recent developments in the use of microbes in industrial products? Why do microbes serve as most ideal organisms in industrial applications? $8+7=15$

(b) Explain the progressive sterilization of potentially sporogenous tissue found in Bryophyta. Add a note on the role of elaters. $5+5=10$

(c) Describe the structure and chemical composition of TMV. How does it infect the host? $10+5=15$

Q4. (a) Describe the organization of female cone in Pinus. Discuss on the morphological nature of ovuliferous scale. $10+5=15$

(b) Comment on how far Selaginella advances towards seed habit. $10$

(c) What is Systemic Acquired Resistance (SAR)? Discuss the role of salicylic acid in SAR. $7+8=15$
SECTION B

Q5. Answer the following keeping your answers brief and to the point. \(8 \times 5 = 40\)

(a) How do you justify *Asteraceae* as a phylogenetically advanced family in dicotyledons? \(8\)

(b) Explain ‘Nemec phenomenon’ and its significance. \(8\)

(c) What are cortical vascular bundles? How are they formed? \(3+5=8\)

(d) Discuss the role of Botanical Gardens in conservation of plants. \(8\)

(e) What is haploid cell culture? How is this technique useful in agriculture? \(8\)

Q6. (a) Give an account of Cronquist’s classification of flowering plants. Add a note on merits and demerits of this system of classification. \(10+5=15\)

(b) What is totipotency? Give an experimental evidence to demonstrate it. \(5+10=15\)

(c) What is Helobial type of endosperm? Describe the process of its development. \(4+6=10\)

Q7. (a) What is polyembryony? How is it induced? Discuss its applications. \(5+5+5=15\)

(b) Write the botanical name of the plants, their family, economically important plant parts and uses for the following:

(i) Cinnamon
(ii) Clove
(iii) Saffron
(iv) Nutmeg
(v) Lesser Cardamom \(15\)

(c) Compare the floral characters of *Malvaceae* and *Solanaceae*. Give the floral diagrams of the two families. \(5+5=10\)
Q8. (a) Name the four types of tea recognized in the trade. What are their properties and methods of processing? 2+6+7=15

(b) Describe the organization of essential organs of Asclepiadaceae family. Discuss the pollination mechanism in it. 6+9=15

(c) Give an account on hydrocarbon plants and their potential as a source of sustainable energy. 10