

Time Allowed : Three hours

Maximum Marks : 300

The figures in the margin indicate full marks for the questions

Candidates should answer Question Nos. 1 and 5 which are compulsory and *any three* of the remaining questions, selecting at least **one** from each Section

Answers must be written in ENGLISH only

Neat sketches may be drawn, wherever required

SECTION—A

1. Answer any *three* of the following in not more than 200 words each : $20 \times 3 = 60$

- (a) Give an account of the physical and chemical organisation of bacterial cell wall.
- (b) Explain the evolutionary significance of heterospory.
- (c) Discuss various symptoms of plant diseases caused by fungus.
- (d) Give an account of the production of bacterial biofertilizer.
- (e) Discuss the degeneration of sexuality in Ascomycetes.

2. Distinguish between the following :

$12 \times 5 = 60$

- (a) Flagella and pili
- (b) Gram-positive and gram-negative bacteria
- (c) Magnetosomes and phycobilisomes
- (d) Facultative parasites and facultative saprophytes
- (e) Chlamydospores and blastospores

3. Answer the following :

15×4=60

- (a) Give an account of the post-fertilization changes leading to the formation of cystocarp in Rhodophyceae.
- (b) "There is a progressive sterilization of sporogenous tissue in bryophytes." Discuss the statement.
- (c) Give an illustrated account of the sexual reproduction in *Voucheria* and comment on its systematic position.
- (d) Critically examine different views pertaining to the evolution of thallus in green algae.

4. Write critical notes on the following :

12×5=60

- (a) Clamp connection
- (b) Spore dispersal mechanism in bryophytes
- (c) Rhizophore of *Selaginella*
- (d) Sexual reproduction in diatoms
- (e) Heterocyst

SECTION—B

5. Answer any *three* of the following in not more than 250 words each : 20×3=60

- (a) Differentiate between the leaf anatomy of C_3 and C_4 plants.
- (b) Discuss different principles that govern the distribution of mechanical tissues in the plant body.
- (c) Describe the nuclear divisions and developmental pattern of *Peperomia* type of female gametophyte in angiosperms.
- (d) Bring about the similarities and dissimilarities between the systems of plant classification of Bentham and Hooker, and Hutchinson.
- (e) What are somatic hybrids? Discuss their role in plant improvement.

6. Answer the following :

15×4=60

- (a) Compare and contrast the Bennettitalean fructification with the present-day angiospermic flower.

- (b) Describe the seed structure attributed to the members of pteridosperms.
- (c) Give an account of the developmental process and cellularization of different types of endosperm.
- (d) Give the distinguishing characters, floral formulae and floral diagrams of the following families :
- (i) Poaceae
 - (ii) Brassicaceae
 - (iii) Asteraceae

12×5=60

7. Write explanatory notes on the following :

- (a) Study of palynology in relation to taxonomy
- (b) The concept of progymnosperms
- (c) Centres of origin of cultivated plants as proposed by Vavilov
- (d) Triple fusion
- (e) Floral architecture of orchids

8. Write the correct botanical name and the family to which it belongs, and the parts used for each of the following : (2+2+2)×10=60

- (a) Olive
- (b) Borage
- (c) Nutmeg
- (d) Vetiver
- (e) Soap nut
- (f) Ishabgul
- (g) Mint
- (h) Clove
- (i) Opium
- (j) Cane
