



2024

A20

BOOKLET NO.

220176

**Forest Services**  
**Botany**

**Time Allowed : Three Hours**

**Maximum Marks : 200**

**Medium : English**

**Type of Paper : Conventional**

**Question Paper Specific Instructions**

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

1. There are **EIGHT** questions divided in two Sections, out of which **FIVE** are to be attempted.
2. Questions no. 1 and 5 are compulsory. Out of the remaining questions, **THREE** are to be attempted choosing at least **ONE** question from each Section.
3. The number of marks carried by a question/sub question is indicated against it.
4. Keep in mind the word limit indicated in the question if any.
5. Wherever option has been given, only the required number of responses in the serial order attempted shall be assessed. Unless struck off, attempt of a question shall be counted even if attempted partly. Excess responses shall not be assessed and shall be ignored.
6. Candidates are expected to answer all the sub-questions of a question together. If sub-question of a question is attempted elsewhere (after leaving a few page or after attempting another question) the later sub-question shall be overlooked.
7. Any page or portion of the page left blank in the Answer Booklet must be clearly struck off.
8. Unless otherwise mentioned, symbol and notation have their usual standard meanings. Assume suitable data, if necessary and indicate the same clearly.
9. Neat sketches may be drawn, wherever required.
10. The medium of answer should be mentioned on the answer book as claimed in the application and printed on admission card. The answers written in medium other than the authorized medium will not be assessed and no marks will be assigned to them.

**Note** – 1. Candidates will be allowed to use Scientific (Non-programmable type) calculators.

**P.T.O.**

SEAL

**SECTION - A**

- Q1.** Write short notes on **any five** from seven. **(8×5=40)**
- (a) Give difference between prokaryotic and eukaryotic cell with suitable example.
  - (b) Give chemical composition and functions of nuclear envelope.
  - (c) Explain importance of diseases caused by bacteria and give symptoms of bacterial plant diseases with any one example.
  - (d) Explain structure and reproduction of class Musci (Bryophyta) and add brief note on a economic potential of Bryophyta.
  - (e) Give salient features and structure of Cycadofilicales with suitable examples.
  - (f) Define plant succession. Give types and causes of succession.
  - (g) What is Pollution ? Give types of water pollution with their control measures.
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- Q2.**
- (a) Define mitosis. Explain various stages of mitosis and give significance of mitotic cell division. **15**
  - (b) Explain general properties of viruses and give their structure with suitable diagram. **15**
  - (c) How evolution of algae takes place from unicellular to multicellular structure with diagrammatic representation. **10**
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- Q3.**
- (a) Give structure and reproduction of class Sphenopsida in Pteridophyta with suitable examples. **15**
  - (b) Define stomata. Give different types of stomata with suitable diagram and its examples. **15**
  - (c) What is an ecosystem ? Give various components of ecosystem with an example. **10**
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- Q4.**
- (a) Give different types of Forest in India and explain role of afforestation and social forestry in minimising pollution. **15**
  - (b) What are chromosomes ? Describe structure of polytene chromosomes and lampbrush chromosomes with suitable diagram. **15**
  - (c) Give applications of microbiology in industry and medicines. **10**
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**SECTION - B**

**Q5.** Write short notes on **any five** from seven. **(8×5=40)**

- (a) Describe the mechanism of Ion transport in plants and explain the difference between passive and active transport.
- (b) Explain sex-linked inheritance with an example. How does it differ from the autosomal inheritance ?
- (c) What is plant introduction in breeding ? Explain its significance and provide an example.
- (d) What is totipotency and differentiation in plant cells ? Explain their significance in plant tissue culture.
- (e) Describe how plants serve as a source of fibre. Give examples of different types of plant fibres and their uses.
- (f) Describe the methods of gene mapping and explain their significance in genetics.
- (g) What is male sterility in plants ? Explain its types and significance in hybrid seed production.

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- Q6.** (a) Describe the process of photosynthesis in plants. Explain the light-dependent and light-independent reactions highlighting their significance in energy production and carbon fixation. **15**
- (b) Explain the molecular basis of mutation. Discuss the types of mutation based on molecular changes and their effect on gene function. **15**
- (c) What is ethnobotany ? Discuss its significance in India with example. **10**
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- Q7.** (a) Describe the methods of gene transfer in plants and animals. Explain their significance in genetics. **15**
- (b) Explain tissue and organ culture in plants. Discuss their types, techniques and application in biotechnology. **15**
- (c) Describe the theories of organic evolution and explain their significance in understanding the origin of species. **10**
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- Q8.** (a) Explain photoperiodism and its role in flowering of plants. Discuss the classification of plants based on photoperiodic response and the role of phytochromes in regulating the flowering in plants. **15**
- (b) Explain the tests of significance used in statistical analysis. Discuss their types and applications in hypothesis testing. **15**
- (c) What are somatic hybrids ? Explain the process of somatic hybridization and its significance in crop improvement. **10**
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