

Botany

Paper -II

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

Answer 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 250 words each: 20×3 = 60
 - a. Describe structure of DNA. How DNA differs from RNA.
 - b. Describe different types of RNA with special reference to their role in Protein Synthesis
 - c. Describe structure of Nucleus in a Eukaryotic cell.
 - d. Write a brief note on cytoplasmic inheritance
 - e. Describe biochemical and molecular basis of Mutation.

2. Write critical notes on the following: 12×5=60
 - a. Describe the process of translation of genetic code to form proteins.
 - b. What is micro propagation and how it can be used in multiplication of desirable plants for farming.
 - c. How transgenic plants can be used for crop improvement. What is the future of transgenic plants?
 - d. Describe the somatic hybrids. Discuss their role in crop improvement.
 - e. Explain standard deviation taking example from an agricultural field.

3. Answer the following: 15×4=60
- a. What do you understand by recombinant DNA technology? What are its prospects in crop improvement programs?
 - b. What are genomic libraries and how they can be prepared?
 - c. Write a note on different kinds of vectors used for gene transfer.
 - d. Discuss different techniques available for isolation of genes.
4. Answer the following: 12×5=60
- a. Describe correlation and regression with special reference to their role in analysis of data.
 - b. Describe in brief basic principle of theory of evolution given by Charles Darwin.
 - c. What are molecular markers? How they can be used in Plant Breeding programs?
 - d. Write a note on sex-chromosomes and sex-linked inheritance.
 - e. Describe structure of Mitochondria. Why they are called "Power House" of a cell.

SECTION-B

5. Answer any **three** of the following is note more than 250 words each: 20×3=60
- a. Write a detailed note of biological nitrogen fixation and its significance.
 - b. Describe the mechanisms of trapping of solar energy by green plants.
 - c. What re Enzymes? Given an account of classification of Enzymes.
 - d. Write an illustrative note on Photoperiodism and its significance with reference to flowering in plants.
 - e. What is the molecular basis of fruit ripening. Can it be manipulated? Give methods.

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6. Answer the following questions: 15×4=60
- a. Define Global Warming. How it affects the climate change?
 - b. Define Plant Succession with special reference to an aquatic ecosystem.
 - c. What are the methods of phytoremediation of pollution.
 - d. Define pollution and enumerate reasons of air pollution.
7. Answer the following: 12×5=60
- a. Describe biogeochemical cycles, enumerating their significance.
 - b. Write short note on 'Project Tiger' What is the present status?
 - c. What is the importance of developing National Parks and Reserved Forests?
 - d. Define RET species. What type of efforts are required to save an endangered species.
 - e. What do you know about social forestry? Can it be instrumental in reinstating depletion in Bio diversity?
8. Write notes on the following: 12×5=60
- a. Define endemic species and their significance for local ecosystems.
 - b. Write a note on intellectual property right and its legal frame work.
 - c. Describe Calvin Cycle. How the cycle differs from Hatch & Slack Cycle?
 - d. What is Photorespiration? Write a note on its significance.
 - e. Define oxidative Phosphorylation. How it differs from Photo-phosphorylation? Illustrate both.

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Neat sketches may be drawn, wherever required

SECTION - A

1. Answer any **three** of the following in not more than 250 words each: 20×3 = 60
 - a. Discuss Economic importance of cyanobacteria
 - b. Explain significance of Microbiology in Agriculture
 - c. Describe structure of a Bacteriophage
 - d. Write a brief note on Fungal toxins
 - e. Define a Plasmid. Describe its role in 'gene transfer' with the help of an example

2. Distinguish between the following: 12×5=60
 - a. Algae and Fungi
 - b. Obligate and Facultative parasite
 - c. Phycomycetes and Ascomycetes
 - d. Bacteria and Cyanobacteria
 - e. Mycoplasma and Virus

3. Answer the following: 15×4=60
- a. Give an illustrated account of types of prothallus (gametophytes) in Lycopodium
 - b. Describe the Stejar system in Pteridophyte with the help of diagrams
 - c. Under any recognised scheme of classification classify Gymnosperms. Add a note on their distribution
 - d. Describe any two fossil Gymnosperms
4. Write critical notes on the following: 12×5=60
- a. Elators and their role
 - b. Vegetative propogation in BRYOPHYTES
 - c. Sporophyte of Anthoceros
 - d. Heterospory and its significance
 - e. Special features of sporophyte of Marchantia. Draw neat, labelled diagram

SECTION-B

5. Answer any **three** the following in not more than 250 words each: 20×3=60
- a. Give major differences between C₃ & C₄ plants
 - b. Describe anomalous secondary growth in Dicots with the help of two examples
 - c. What is an Embryo-Sac? Describe different types of Embryo-Sacs
 - d. Write note on development of Endosperm and its function
 - e. Give Characteristic features of family Asclepiadaceae
6. Anser the following questions: 15×4=60
- a. Write a brief note on Ethnobotany and its role in human welfare
 - b. Give merits and demerits of Hutchinson's Systems of classification

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- ✓ c. What do you understand by a Herbarium? Write a note on Indian Herbaria
- d. Write the names of at least ten Botanical gardens of the world with at least five from India
7. Write explanatory notes on the following: 12x5=60
- a. Justify the statement "Bacteria are our friends as well as foes"
 - b. Describe lytic and lysogenic cycle of viral infection
 - c. Differentiate between Prokaryotes and Eukaryotes
 - d. Describe any two plant diseases caused by fungal pathogens
 - e. How transformation and transduction differ from each other
8. Write the correct botanical name and the family to which it belongs, and the parts used for each of the following: 2+2+2x10=60
- a. Tulsi
 - b. Neem
 - c. Ashwagandha
 - d. Gwarpatha
 - e. Aanwla
 - f. Garlic
 - g. Ginger
 - h. Turmeric
 - i. Rose
 - j. Cotton