

UPSC Mains 2025 Aug 31, 2025 Botany (Paper 2) Question Paper and Answer Key PDF

Q. No.	Question	Check Solution
Q1 (A)	Write short notes in 150 words: Nuclear pore complex	Check Solution
Q1 (B)	Write short notes in 150 words: Epistasis	Check Solution
Q1 (C)	Write short notes in 150 words: Synaptonemal complex	Check Solution
Q1 (D)	Write short notes in 150 words: Amphidiploidy	Check Solution
Q1 (E)	Write short notes in 150 words: Lysosome	Check Solution
Q2 (A)	What are the different methods of DNA sequencing? Elaborate the shotgun sequencing method.	Check Solution
Q2 (B)	Describe the phenomenon of linkage by giving suitable examples. Why is the linkage an exception to Mendel's second law?	Check Solution
Q2 (C)	Explain the structure and behaviour of B chromosomes in plants.	Check Solution
Q3 (A)	Elucidate the molecular basis of sex determination in plants. Explain the role of homomorphic and heteromorphic sex chromosomes.	Check Solution
Q3 (B)	Describe the structure of nucleosome and its role in DNA packaging.	Check Solution
Q3 (C)	Explain in detail the various methods of plant hybridization.	Check Solution
Q4 (A)	What is organic evolution? Discuss in detail the indirect evidences of organic evolution with suitable examples.	Check Solution
Q4 (B)	Describe the structure of chloroplast with labelled diagram and write about its functions.	Check Solution
Q4 (C)	Discuss in detail the role of mutations in plant breeding and crop improvement.	Check Solution
Q5 (A)	Write short notes in 150 words: Tests of significance	Check Solution
Q5 (B)	Write short notes in 150 words: Kranz anatomy and its significance	Check Solution
Q5 (C)	Write short notes in 150 words: Vernalization	Check Solution
Q5 (D)	Write short notes in 150 words: The IUCN Red List categories	Check Solution
Q5 (E)	Write short notes in 150 words: Endemism	Check Solution
Q6 (A)	What are transgenic crops? Discuss the prospects and risks involved in their cultivation.	Check Solution
Q6 (B)	What is biological nitrogen fixation? Explain the mechanism of symbiotic nitrogen fixation with examples.	Check Solution
Q6 (C)	Describe the different forest types in India. Discuss in detail the crucial ecosystem services provided by these forests.	Check Solution
Q7 (A)	What are the different gene transfer methods in plants? Give a brief account of direct gene transfer methods.	Check Solution
Q7 (B)	What are the different carbon fixation pathways in plants? Discuss in detail the CAM pathway and its role in stomatal activity.	Check Solution

Q7 (C)	What are the causes and consequences of global warming and climate change? Explain the approaches to deal with global warming.	Check Solution
Q8 (A)	Define biodiversity. Explain the various ex situ and in situ methods of conserving biodiversity.	Check Solution
Q8 (B)	What are phytohormones? Briefly discuss the role of auxin in plant growth and development. Explain its mechanism of action.	Check Solution
Q8 (C)	Describe the various types of tropic movements in plants. Discuss their mechanism.	Check Solution

