



**PUNJAB PUBLIC SERVICE COMMISSION**  
**COMBINED COMPETITIVE EXAMINATION**  
**FOR RECRUITMENT TO THE POSTS OF**  
**PROVINCIAL MANAGEMENT SERVICE, ETC -2022**  
**CASE NO. 2C2023**

**SUBJECT: BOTANY (PAPER-I)**

**TIME ALLOWED: THREE HOURS**

**MAXIMUM MARKS: 100**

**NOTE:**

- i. All the parts (if any) of each Question must be attempted at one place instead of at different places.
- ii. Write Q. No. in the Answer Book in accordance with Q. No. in the Q. Paper.
- iii. No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.
- iv. Extra attempt of any question or any part of the question will not be considered.

Attempt FIVE Questions in All. Attempt in Urdu or English.

- Q. No.1 Describe characteristic features of Diatoms with special reference to their structure, reproduction and ecology. (20 Marks)
- Q. No.2 Differentiate between the following: (10+10=20 Marks)
- a. Rusts and Smut
  - b. Wilts and Rots
- Q. No.3 Write notes on: (10+10=20 Marks)
- a. Parasexual cycle in Fungi
  - b. Ascus and Basidium development.
- Q. No.4 Describe in detail the general characteristics, classification and economic importance of Bryophytes. (20 Marks)
- Q. No.5 What is Heterospory? Explain seed habit in *Selaginella*. Also write why it failed to produce seed. (20 Marks)
- Q. No.6 What are Seed Ferns? How they are Classified? What is the evolutionary significance of Seed Ferns in Geological Time Scale? (20 Marks)
- Q. No.7 Differentiate between Plesiomorphy and Apomorphy? How such terms are useful in determining the evolution in Angiosperms? (20 Marks)
- Q. No.8 What is Numerical taxonomy? Write its principle, merits, demerits and its applications. (20 Marks)
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**CASE NO. 2C2023**

**SUBJECT: BOTANY (PAPER-II)**

**TIME ALLOWED: THREE HOURS**

**MAXIMUM MARKS: 100**

**NOTE:**

- i. All the parts (if any) of each Question must be attempted at one place instead of at different places.
- ii. Write Q. No. in the Answer Book in accordance with Q. No. in the Q. Paper.
- iii. No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.
- iv. Extra attempt of any question or any part of the question will not be considered.

**NOTE:** Attempt FIVE Questions. Attempt in Urdu or English.

- Q. No.1 a) Explain in detail how does the process of glycolysis help in the conversion of hexoses into pyruvic acid?  
b) Describe Formation of acetyl coenzyme A.  
c) Discuss energy transformation in respiration. (10+5+5=20 Marks)
- Q. No.2 a) Write the mechanism of Electron Transport System (ETS) in respiration process.  
b) Differentiate among C3, C4 and CAM Plants. (10+10=20 Marks)
- Q. No.3 a) Discuss the role of edaphic and climatic factors on plant growth.  
b) Discuss briefly the following ecosystems:  
i). Wetlands ii). Mangroves (10+10=20 Marks)
- Q. No.4 Differentiate between the following: (5X4=20 Marks)  
a) Glyoxisomes and peroxisomes.  
b) Chromoplast and leucoplast.  
c) Primary cell wall and secondary cell wall.  
d) Smooth endoplasmic reticulum and rough endoplasmic reticulum.
- Q. No.5 Describe the similarities and differences between RNA and DNA. Also discuss the three main types of RNA used in protein synthesis. (20 Marks)
- Q. No.6 Explain the process of linkage. Also differentiate between the following:  
i) Test cross vs Back cross ii) Monohybrid cross vs Dihybrid cross (20 Marks)
- Q. No.7 a) What do you understand by Lamarckism? Discuss its all points, including the example of long neck and legs of giraffe along with other examples.  
b) Differentiate between microevolution and macroevolution. (15+5=20 Marks)
- Q. No.8 How is random mutation hypothesis different from adaptive mutation hypothesis? Elaborate with suitable examples. (20 Marks)