

### PUNJAB PUBLIC SERVICE COMMISSION

# COMBINED COMPETITIVE EXAMINATION FOR RECRUITMENT TO THE POSTS OF PROVINCIAL MANAGEMENT SERVICE -2020

SUBJECT:

BOTANY (PAPER-II)

TIME ALLOWED:

**THREE HOURS** 

**MAXIMUM MARKS: 100** 

#### NOTE:

- 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.
- 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 any FIVE Questions in all. Attempt ONE Question from Each Section. Attempt in Urdu or English.

#### SECTION-I

- Q. No. 1 a) Define photoperiodism. Classify plants on the basis of photoperiodism with the concept of critical day length and role of phytochromes.
  - b) Discuss various types of photosynthetic pigments. Give detail of chemistry of chlorophyll with the help of structural formulae. (10+10=20 Marks)
- Q. No. 2 a) Describe auxins regarding their mode of action, effects and application in agriculture.
  - b) What are enzymes? Explain their chemical nature and mechanism of action with the help of different models and concept of kinetics of enzyme action.

(10+10=20 Marks)

#### SECTION-II

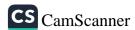
- Q. No. 3 a) Discuss Eco-physiological responses of plants to light. Also mention the effects of temporal and spatial variations of light.
  - b) Differentiate between Trophic level and Ecological pyramid. Describe various types of ecological pyramids with the help of proper diagrams. (10+10=20 Marks)
- Q. No. 4 a) Write note on Himalayan moist temperate forest describing its various characteristics and location in Pakistan.
  - b) What is meant by conservation of natural resources? Mention main conservation issues and national strategies for conservation in Pakistan. (10+10=20 Marks)

#### **SECTION-III**

- Q. No. 5 a) Write note on cytoskeleton with special reference to their role in various types of movements.
  - b) Differentiate between cytokinesis and karyokinesis and explain them with reference to mitosis in plant cell. (10+10=20 Marks)
- Q. No. 6 a) Write notes on nuclear envelop and Golgi apparatus.
  - b) How meiosis is reductional as well as equational division. Explain events of Prophase I with suitable diagrams.
  - c) How apoptosis is different from necrosis in action and significance.
  - d) What is cancer? Highlight the factors causing increase in its incidence and write its control.

(4x5=20 Marks)

P.T.O



#### **SECTION-IV**

- Q. No. 7 a) Differentiate between linkage and crossing over. Construct three point linkage map taking example of maize.
  - b) Explain transcription, highlighting its differences in prokaryotes and Eukaryotes.

(10+10=20 Marks)

Q. No. 8 a) Explain fine structure of gene in eukaryotes with diagram.

(10 Marks)

- b) Write short notes on:
  - Genetic code, its characteristics and write why it is called universal but not quite universal with examples.
  - ii. Autopolyploidy and Allopolyploidy giving examples and their role in speciation.

    (2x5=10 Marks)

#### SECTION-V

- Q. No. 9 a) Explain five evidences in favour of evolution by natural selection with examples.
  - b) Define Hardy Weinberg law. Explain various factors affecting allele frequency with suitable examples for each. (10+10=20 Marks)
- Q. No. 10 a) Give comparison of Lamarckism and Darwinism. Describe evolution of long necked giraffe according to each, separately.
  - b) Define adaptive mutations. Explain with the help of two major experiments in *Escherichia coli.* (10+10=20 Marks)

