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:

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 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)

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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:

i. 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)