Indian Forest Service
(Main) Exam, 2021

ZCVB-B-BTN

BOTANY

Paper – II

*Time Allowed : **Three** Hours*

*Maximum Marks : **200***

Question Paper Specific Instructions

Please read each of the following instructions carefully before attempting questions :

*There are **EIGHT** questions in all, out of which **FIVE** are to be attempted.*

*Questions no. **1** and **5** are compulsory. Out of the remaining **SIX** questions, **THREE** are to be attempted selecting at least **ONE** question from each of the two Sections A and B.*

Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

All questions carry equal marks. The number of marks carried by a question/part is indicated against it.

Neat sketches may be drawn, wherever required.

*Answers must be written in **ENGLISH** only.*

SECTION A

Q1. Write short notes on the following : *8×5=40*

(a) Chi-square test *8*

(b) Polyribosomes *8*

(c) Crossing over *8*

(d) Non-coding RNA *8*

(e) Cell signalling *8*

Q2. (a) Define monohaploids. How can haploids be produced artificially ? Describe. *5+15=20*

(b) How can genetically uniform plants be produced through micropropagation technique ? *10*

(c) What is the utility of test cross in plant breeding ? *10*

Q3. (a) Describe the structure of heterochromatin and euchromatin. How is constitutive heterochromatin different from facultative heterochromatin ? *15+5=20*

(b) What are lysosomes ? Discuss various functions of lysosomes. *10*

(c) Discuss the biogenesis of chloroplast. *10*

Q4. (a) Write a detailed note on direct evidences of organic evolution. *20*

(b) Describe in brief the molecular map of Ti plasmid. *10*

(c) Write a note on linear regression. What are 'residuals' and why are they important for statistical analysis ? *10*

SECTION B

Q5. Write short notes on the following :

(a) Convention on Biological Diversity *8*

(b) Role of Cytokinin in leaf senescence *8*

(c) Active ion transport in plants *8*

(d) Polarity of water and its significance *8*

(e) Inter-relationship between nitrogen and carbon assimilation in plants *8*

Q6. (a) How is ethylene, 'as a phytohormone', different from other hormones ? Explain its mechanism of action and physiological effects. *5+5+10=20*

(b) What is enzyme inhibition ? Describe reversible enzyme inhibition and its types, giving suitable examples. *10*

(c) Explain the mechanism and factors causing dormancy of seeds. *10*

Q7. (a) Name the complexes and their composition associated with electron transport chain in plant mitochondria. Describe the role of ubiquinone in ATP synthesis in mitochondria. *10+10=20*

(b) "Calvin cycle is autocatalytic." – Justify the statement. *10*

(c) Explain that C_2 cycle returns to the C_3 cycle, three-quarters of the carbon that would have been lost as glycolate. *10*

Q8. (a) Write a detailed note on secondary succession sequence of a forest, post clear felling. Explain the importance of soil seed bank and vegetation diversity in adjacent areas of clear-felled area on the diversity of regenerated ecosystem. *10+10=20*

(b) What are point and non-point sources of pollution ? Describe the role of gaseous emissions from a thermal power plant on the atmospheric pollution loads of the area where these thermal power plants are functional. *7+3=10*

(c) Write a detailed note on biodiversity hotspots of India. Why is endemism high in such areas ? *7+3=10*