I.F.S. EXAM-(M) 2018

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.

Question Nos. **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

1. Write a short note on each of the following : 8×5=40

(a) Packaging of DNA in chromatin

(b) Chloroplast dimorphism

(c) Post-transcriptional modifications of mRNA

(d) Role of endoplasmic reticulum in protein sorting and targeting

(e) Objectives and properties of probability

2. *(a)* Describe the molecular basis of cell cycle transitions with suitable illustrations. Explain the role of CDKs in controlling transitions between cell cycle stages. 10+10=20

(b) Discuss the mechanism of transport of molecules across the cell membrane by uniport, symport and antiport. Add a note on co-transport by symporter and uniporter. 15+5=20

3. *(a)* Describe the molecular mechanism of gene linkage and crossing-over. Explain how gene mapping is constructed using gene linkage with suitable diagrams. 10+10=20

(b) Describe different methods of selection and hybridization in plant breeding. Give a note on heterosis breeding. 15+5=20

4. *(a)* Describe different stages of micropropagation in detail, mentioning the significances of each stage. Give a brief account on commercial micropropagation. 15+5=20

(b) Describe the initiation of translation process in prokaryotes with suitable illustrations. How does it differ from eukaryotes? 15+5=20

SECTION—B

5. Write a brief note on each of the following : 8×5=40

(a) Role of Rubisco in carbon metabolism

(b) Importance of different types of secondary metabolites in plant defense and as pharmaceuticals

(c) Endemism and endangered plant species

(d) Hot spots in India : Characteristics and conservations

(e) Allosteric enzymes and metabolic control

6. (a) Illustrate the structure of ATP synthase and discuss the mechanism of ATP synthesis in higher plants. 5+15=20

(b) Explain elaborately the molecular basis of fruit ripening. How can this process be manipulated? 15+5=20

7. (a) Discuss the mechanism of nitrogen fixation associated with legumes and elaborate the factors controlling the process. 10+10=20

(b) Describe the adaptive responses at the morphological and physiological levels in higher plants to water deficit stress conditions. 10+10=20

8. (a) Explain the ecological characteristics of different types of forests found in India. Describe briefly about the dominance of vegetation types of tropical and alpine forests. 10+10=20

(b) Discuss the concept of climax community. Write a note on succession of estuarine ecosystem. 10+10=20

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