



WEST BENGAL STATE UNIVERSITY

B.Sc. Honours Part-III Examination, 2020

BOTANY

PAPER-BOTA-VII

Time Allotted: 2 Hours

Full Marks: 50

*The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.*

1. Answer the following questions in brief: 10
 - (a) What happens to a living cell when it is placed in a hypotonic solution? 1
 - (b) What is Kranz anatomy? 2
 - (c) Name a pentose and a heptose sugar formed during the Calvin cycle. 2
 - (d) What is Cavitation? Does it affect water transport in plants? 2
 - (e) Give the structure of a naturally occurring cytokinin. 2
 - (f) State the role of leghaemoglobin. 1

2. Answer any **one** question from the following: 5×1 = 5
 - (a) Mention the dual role of Rubisco with chemical reactions. Name the organelles involved in photorespiration. 4+1
 - (b) Write down the reactions where decarboxylation and substrate level phosphorylation take place in TCA cycle. 2½+2½
 - (c) Draw and describe the process of nodule formation in leguminous plants. 5
 - (d) Describe the role of G-protein in signal transduction pathway in plants. 5
 - (e) Comment on the role of blue light and K⁺ ion in stomatal movement. 2½+2½
 - (f) Explain the mass flow hypothesis in phloem transport. 5
 - (g) Schematically represent the Z scheme of photosynthetic light reaction. 5
 - (h) Name a gaseous plant hormone. Mention its physiological importance in plants. 1+4

3. Answer any **one** question from the following: 10×1 = 10
 - (a) Write down the process of IAA biosynthesis from tryptophan with the help of flow chart. Write down the role of cytokinin in senescence. 8+2
 - (b) Discuss the organic acid metabolic pathway in CAM plants. Mention the similarities and dissimilarities between CAM and C₄ plants. What is CAM-idling? 6+3+1
 - (c) How does innate dormancy differ from induced dormancy? What are the causes of seed dormancy? Describe the methods of breaking dormancy in seeds. 2+3+5

- (d) Schematically describe the preparatory and pay off phases of glycolysis mentioning the enzymes involved in the process. Write down the reversible reactions and the number of ATP produced during the pathway. 7+3
- (e) Describe the enzyme responsible for fixation of atmospheric nitrogen. Illustrate the biochemistry of nitrogen fixation in *Rhizobium*. 3+7
- (f) What do you mean by critical day length? Classify the plants on the basis of day length required for flowering. Mention the role of day length in regulation of flowering in different types of plants. 1+5+4
4. Answer any **one** question from the following: 10×1 = 10
- (a) Give a brief account of alkaloids. Mention their significance. 2+3
- (b) Write down the chemical classification of drugs. 5
- OR**
- (c) What are secondary metabolites? How does they differ from primary metabolites. 2+3
- (d) Discuss the role of flavonoids against pathogens. 5
- OR**
- (e) Name any two phytosteroids. Mention their source plants and parts used. Briefly discuss their uses as medicine. 2+(2+2)+4
- OR**
- (f) Mention the scientific name of source plants, parts used and major uses of the following: (1+ $\frac{1}{2}$ +1)×4
- (i) Caffein
- (ii) Gingerol
- (iii) Emetine
- (iv) Barbaloin
- OR**
- (g) Answer the following questions in brief: 5
- (i) What do you mean by transgenic plant? 2
- (ii) What are cybrids? 2
- (iii) What is totipotency? 1
5. Answer any **one** question from the following: 5×1 = 5
- (a) Write down the merits of micropropagation over conventional methods of plant breeding. 5
- (b) What are artificial seeds? Mention its significance. 1+4
6. Answer any **one** question from the following: 10×1 = 10
- (a) What is haploid culture? Briefly state the method of haploid culture technique. Mention its applications. 1+5+4
- (b) Describe how plant genes can be transferred through Ti-plasmid. Mention the importance of this technique. 8+2

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