



**WEST BENGAL STATE UNIVERSITY**  
B.Sc. Honours 5th Semester Examination, 2020, held in 2021

**BOTACOR12T- BOTANY (CC12)**

**PLANT PHYSIOLOGY**

Time Allotted: 2 Hours

Full Marks: 40

*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 **all** questions briefly from the following: 1×6 = 6
- (a) State the Fick's first law in diffusion.
  - (b) What are aquaporins?
  - (c) What happens to water transport if an air bubble forms within the xylem?
  - (d) A source of sugar translocation at one time can become sink later on. Comment on the statement.
  - (e) Name the plant from where Brassinosteroid was first identified.
  - (f) Why it is often said that the flowering pattern of a plant depends on the wavelength last received?
2. Answer any **eight** questions from the following: 3×8 = 24
- (a) There are two adjacent living cell A and B. Cell A has an osmotic potential ( $\Psi_s$ ) of  $-10$  bars and pressure potential ( $\Psi_p$ ) of 5 bars, whereas cell B has an osmotic potential ( $\Psi_s$ ) of  $-5$  bars and pressure potential ( $\Psi_p$ ) of 2 bars. What will be the direction of water flow in the cell?
  - (b) Define the primary active transport and secondary active transport of ions across cell membrane.
  - (c) What are essential and beneficial elements in plant nutrition? Give one example of each.
  - (d) Differentiate between transpiration and guttation.
  - (e) Movement of substances in xylem is unidirectional while in phloem it is bidirectional — Explain the statement.
  - (f) State the functions of jasmonates in plant growth and development.
  - (g) Mention the role of K ion in stomatal movement.
  - (h) What are natural and synthetic plant growth regulators? Give examples.

- (i) What do you mean by the phytochrome mediated responses, HIR (high irradiance response) and LER (low energy response)?
- (j) What is photo reversibility and physiologically active form of phytochrome?
- (k) Give a short note on chrytochrome mediated photoresponses.
- (l) Schematically give the Tryptophan dependent pathway of auxin biosynthesis.

3. Answer any *two* questions from the following: 5×2 = 10
- (a) What is facilitated diffusion? Discuss the role of channel and carrier proteins in the transport of ions across the membrane. 1+4
  - (b) What are the main objections of cohesion-tension theory of ascent of sap? How this objection was explained by Milburn and Johnson (1966)? 5
  - (c) Schematically represent the molecular events observed in gibberellins induced seed germination. 5
  - (d) State the molecular mechanism of vernalization in the light of Flowering Locus C (FLC). 5

**N.B. :** *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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