

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)

CLASS: MSc  
BRANCH: BIOTECHNOLOGY

SEMESTER : I<sup>st</sup>  
SESSION : MO/2025

SUBJECT: BT411 MOLECULAR PLANT PHYSIOLOGY

TIME: 3 Hours

FULL MARKS: 50

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
- 

		CO	BL
Q.1(a)	Draw and label the photosynthetic apparatus involved in photosynthesis. During the light reactions, there are two possible routes for electron flow: cyclic and linear. Define & Compare.	[5] 1	4
Q.1(b)	Compare Chemiosmosis process taking place in chloroplast and mitochondria.	[5] 1	4
Q.2(a)	Diagrammatically compare the physiological events between C3 & C4 & CAM plants. List out approaches undertaken for Engineering C3 plants to minimize photorespiration.	[5] 2	4
Q.2(b)	Diagrammatically explain HMP shunt pathway. Also mention its significance.	[5] 2	3
Q.3(a)	List the photoreceptors associated with blue light response and discuss their gene family. Diagrammatically show the domain structure of plant Cryptochrome. Also list out the functions of cryptochrome.	[5] 2	3
Q.3(b)	Discuss the regulators of Photomorphogenesis of Phytochrome pigment and elaborate their mechanism in light / dark conditions with diagram.	[5] 2	3
Q.4(a)	Sketch an outline for the development of a transgenic crop for abiotic stress tolerance. Discuss any one approach giving an example.	[5] 3	3
Q.4(b)	Discuss the role of ABA in stomatal functions and transpiration regulation.	[5] 3	2
Q.5(a)	Describe about the discovery and functions of any plant growth regulator and explain its mechanism of action diagrammatically.	[5] 4	3
Q.5(b)	Illustrate & analyze the role of plant hormones in cross talk in regulating the effect of biotic and abiotic stress.	[5] 4	4

:::::25/11/2025:::::E