Reg. No. :…….Name: ……..**P 318**

MSc DEGREE EXAMINATION OCTOBER 2015

SEMESTER: 3, SUBJECT: BOTANY

COURSE: P3BOTT10 – PLANT PHYSIOLOGY & PLANT BREEDING

Time: Three Hours Max. Marks: 75

I. Answer ***any eight*** questions briefly; each question carries **2 marks**

1. Write a note on soil-plant-atmosphere continuum
2. What are aquaporins?
3. What is alternative oxidase? Mention its function
4. Define gluconeogenesis.
5. What are cryptochromes?
6. Illustrate the chemical structure of ethylene. List out the major roles of ethylene in plant life
7. Write an account on hydathodes
8. What are uncouplers? Cite two examples
9. Define RQ. Explain how RQ varies with variations in respiratory substrate
10. Write an account on cytoplasmic male sterility
11. Describe inbreeding depression. How it differs from hybrid vigor?
12. Differentiate between vertical and horizontal resistance (2 x 8 = 16)

II. Answer ***any seven*** questions; each question carries **5 marks**

13. List out the major factors contributing to cell water potential. Write a critical account about the different factors.
14. Write a critical account on the effect of the charge of soil particle and soil pH on nutrient availability in the soil
15. Explain how water is oxidized to oxygen by PS II
16. Elaborate on the process of photorespiration
17. Write an account on the need for photoprotection of the photosynthetic apparatus and the role of carotenoids and xanthophylls as photoprotective agents
18. Elucidate the pressure flow model of phloem transport
19. Explain glyoxylate cycle

(PTO)

20. List out and comment on the major objectives of plant breeding
21. Write a note on the centers of origin of cultivated plants
22. What is back-cross breeding? Explain its significance in plant breeding

(5 x 7 = 35)

III. Answer ***any two*** questions; each question carries **12** marks

23. Explain how the coordinated action of various complexes in the plant mitochondrial inner membrane causes the formation of ATP
24. Write an essay on the formation of root nodules and the consequent fixation of nitrogen through legume – *Rhizobium* interaction
25. Explain the effects of various abiotic stresses on plants
26. Elaborate on mutation breeding and the achievements made through mutation breeding

(12 x 2 = 24)