



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (CROP IMPROVEMENT AND PROTECTION) AND BACHELOR OF EDUCATION (SCIENCE)

KST 214: PLANT PHYSIOLOGY

DATE: Monday 2nd April, 2012

TIME: 2.00 p.m. – 4.00 p.m.

INSTRUCTIONS:

Answer ALL questions in Section A and any TWO in Section B.

SECTION A – (40 MARKS)

1. There are two adjacent cells A and B. Cell A has osmotic potential (γ_s) of -9 bars and pressure potential (γ_p) of 5 bars, whereas cell B has osmotic potential of -7 bars and pressure potential of 2 bars. Show the direction of water flow in the cells. [5 marks]
2. (a) State Graham's law. [2 marks]
(b) Based on the law in (a) above, show CO₂ and O₂ traffic through stomata. [3 marks]
3. Outline the main significances of cyanide resistance pathway in plants. [5 marks]
4. Enumerate five (5) differences between cyclic and non-cyclic electron transport and photophosphorylation of pigeon pea. [5 marks]
5. Explain experimental evidence to confirm the presence of light and carbon reduction processes of photosynthesis in higher plants. [5 marks]
6. Describe the "Richmond-Lang effect" and state its significance in both flower and fresh vegetable production. [5 marks]

7. Explain interactive effect of plant regulators on plant morphogenesis. [5 marks]
8. Describe the common characteristics of plants suffering from chilling injury. [5 marks]

SECTION B (30 MARKS)

9. Discuss external factors that affect respiration in plants. [15 marks]
10. (a) Discuss the components of water potential in plants. [9 marks]
(b) Outline the main differences between diffusion pressure deficit (DPD) and water potential (γ). [6 marks]
11. Give a detailed elucidation of the Calvin cycle based on previous scientific evidence. [15 marks]
12. Discuss physiological effects of gibberellins on a specified crop plant. [15 marks]

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