

**AP OUTLINE: STRUCTURE AND FUNCTION IN PLANTS WITH EMPHASIS ON ANGIOSPERMS**

1. Root, stem, leaf, flower, seed, and fruit
2. Water and mineral absorption and transport
3. Translocation and storage
4. Tropism and photoperiodicity

**ESSAY QUESTIONS**

- 1959: Considering the respective roles played by the root, stem, and leaf in the life of a dicotyledonous plant, contrast the organization of these three organs.
- 1960: With regard to photoperiodism in plants discuss:  
a) one type of plant phenomenon affected;  
b) the mechanism of the operation of photoperiodism;  
c) the relative importance of intensity and duration of light;
- 1961: Discuss the movement of water from the soil through a vascular plant during transpiration with regard to:  
a) tissues traversed  
b) processes and forces involved  
c) environmental factors which are conducive to a high rate of transpiration  
d) the effects of this process upon the plant
- 1962: The opening and closing of the stomata are, in part, associated with the changing osmotic relationships existing between the guard cells and the surrounding epidermis and mesophyll.  
a) Describe the structure of a guard cell and discuss the osmotic relationships that tend to result in stomatal opening. Labeled diagrams may be used as aids in explanation.  
b) Stomata are usually closed in the dark but tend to open in the light. Describe two possible causes of change in the guard cells or in their environment which result in stomatal opening.
- 1964: Each of the five leaf structures indicated in the diagram below is related to either the raw materials of, or by-products of, or regulation of the rate of leaf photosynthesis.  
a) Name the five structures in order.  
b) Discuss how each may regulate or in some way affect the rate of photosynthesis.