Plant Problem Set

You have managed to still a leaf from the mythical money tree! Unfortunately, it appears that most of your cells have died, and you only have a couple of cells that you quickly culture in your petri dish. You subject the plant to various levels of auxin and cytokines. Select all the following true or false statements.

A. The use of high levels of auxin and low levels of cytokines will result in root like growth.
B. Through the application of pure auxin, you can induce continuous cell growth
C. In root cells, auxin induces differentiation of meristematic cells while cytokines induce proliferation
D. High auxin levels in combination with low cytokine levels induce stem formation
E. The combination of high levels of auxin and cytokines will lead to the formation of a callus.

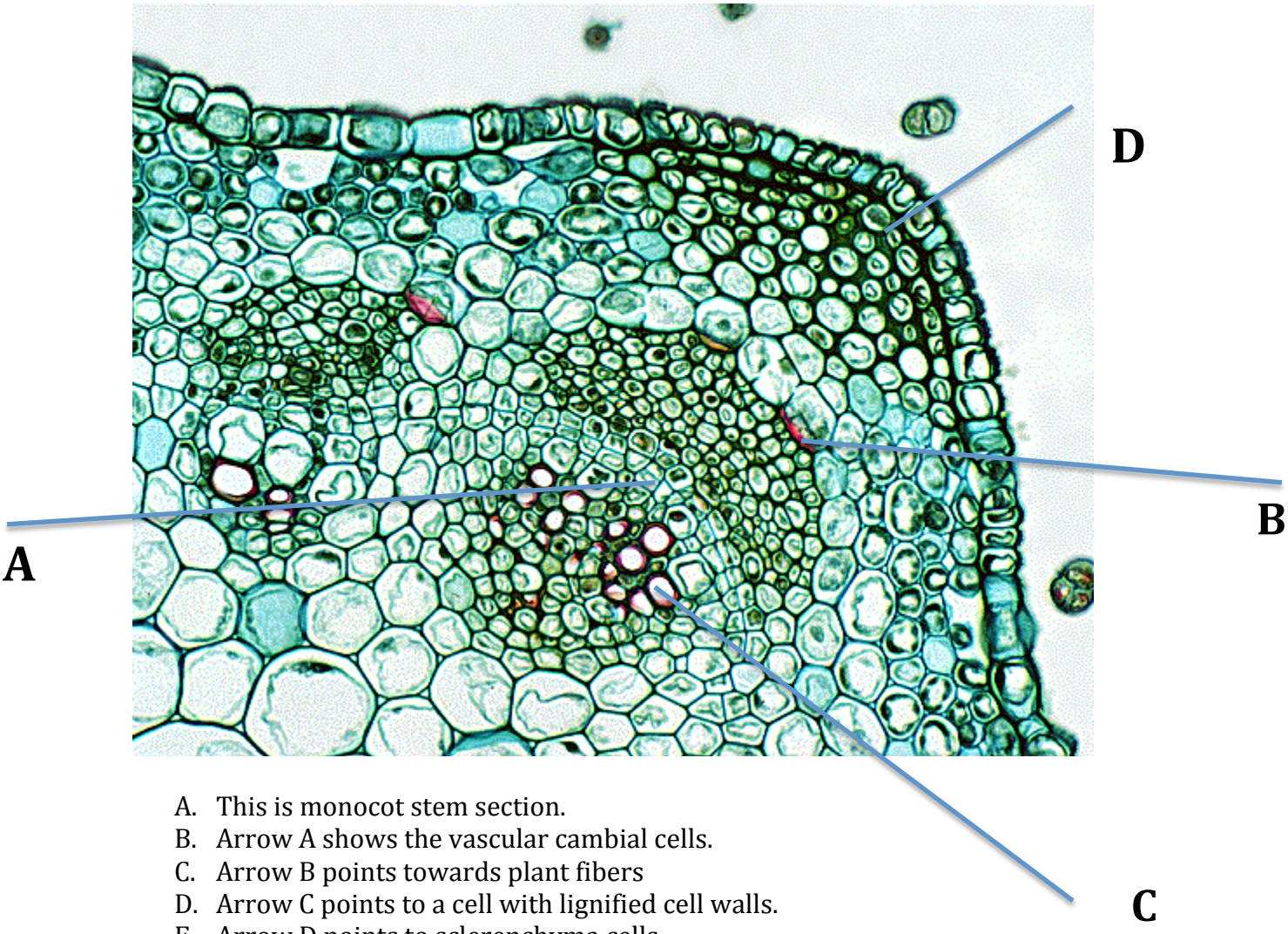
Plant hormones are often used widely in agriculture. Indicate whether each of the following applications of plant hormones to agriculture are correct.

A. Ethylene is often used to accelerate the ripening of tomatoes and other fruits
B. Strawberries are often treated with gibberellins to increase fruit size.
C. Thompson grapes are treated with gibberellins to induce large grapes.
D. Synthetic auxins are often used to selectively kill monocots.

This flower family has perigynous flowers with the corolla and calyx often in five parts. This flower family has a broad range of different seeds ranging from achenes, drupes, follicles, and pommes. This family very important in agriculture. What is this family?

A. Rosaceae
B. Lamiaceae
C. Orchidaceae
D. Runanculaceae

Consider the following diagram of a section.



A. This is monocot stem section.
B. Arrow A shows the vascular cambial cells.
C. Arrow B points towards plant fibers
D. Arrow C points to a cell with lignified cell walls.
E. Arrow D points to sclerenchyma cells

Plants produce many biochemical compounds. Match each of the alkaloids to its function.

I. Used as a leukemia drug and is produced by the periwinkle plant
II. Comes from the coca plant and is used as a local anesthetic by dentists and eye surgeons
III. Found in developing seeding and is used as a highly toxic defense against insects and fungi.
IV. Used as a pupil dilator and cardiac stimulant and as an antidote to nerve gas poisoning.

A. Atropine
B. Cocaine
C. Caffine

D. Vinblastine

Flowering is controlled by a complex array of different plant chemical. Indicate all of the following hormones that are involved with flowering

A. Anthocyanin
B. Florigen
C. Lignin
D. Flavanone

Is it critical for plants for plants to respond to changes in lighting and duration of lighting. There are two primary photoreceptors in plants; blue and red photoreceptors. Answer the following questions about these receptors.

A. Phytochromes are primarly used in determining the photoperiod.
B. Phytochromes are primarly involved in the opening of guard cells in response to light.
C. If a lettuce seeds are exposed to red light at night, the seeds will germinate.
D. By grafting a long day plant's flower onto a short day plant, and exposing the short day plant to condition appropriate to its germination, the long day plant's flower will flower.

Many different types ploidy are found in plant seeds. Consider the ploidy of a pine seed and a flower seed.

A. The ploidy of a flowering plant embryo is 2/3 the ploidy of the nutritional tissue around it.
B. The ploidy of a pine seed embryo is the same ploidy as the nutritional tissue around it.
C. The seed of a pine tree consists of three different generations.
D. The integuments of plants seeds have the same ploidy as the embryo.