Plant Physiology Quiz Answer Key PDF

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Which process in plants involves the conversion of glucose into energy?

A. Photosynthesis
B. Transpiratio
C. Respiration ✓
D. Germination

Which plant hormone is primarily involved in promoting cell elongation?

A. Ethylene
B. Cytokinin
C. Auxin ✓
D. Abscisic acid

What is the primary function of the xylem in plants?

A. Transport of nutrients
B. Transport of water ✓
C. Photosynthesis
D. Respiration

Explain the role of chlorophyll in the process of photosynthesis.

Chlorophyll absorbs light energy, primarily in the blue and red wavelengths, which is then used to convert carbon dioxide and water into glucose and oxygen during photosynthesis.

Describe the role of mitochondria in plant respiration and energy production.

The role of mitochondria in plant respiration and energy production is to convert glucose and oxygen into ATP through cellular respiration.

Which organelle is known as the powerhouse of the cell, crucial for respiration?

A. Chloroplast
B. Mitochondria ✓
C. Nucleus
D. Ribosome

Discuss the importance of transpiration in plant physiology.

Transpirational water loss in plants is essential for nutrient transport, cooling the plant, and maintaining turgor pressure, which supports overall plant structure and function.

Which of the following are essential micronutrients for plants? (Select all that apply)

A. Iron ✓
B. Zinc ✓
C. Copper ✓
D. Magnesium

Which plant hormones are involved in regulating plant growth? (Select all that apply)

A. Auxins ✓
B. Gibberellins ✓
C. Cytokinins ✓
D. Ethylene ✓

What is the main product of the Calvin cycle in photosynthesis?

A. Oxygen
B. Glucose ✓
C. ATP
D. NADPH

What type of tropism is a plant exhibiting when it grows towards light?

A. Gravitropism
B. Thigmotropism
C. Phototropism ✓
D. Hydrotropism

Which processes are involved in plant responses to environmental stimuli? (Select all that apply)

A. Phototropism ✓
B. Gravitropism ✓
C. Thigmotropism ✓
D. Hydrotropism ✓

How do plants adapt to drought conditions at the physiological level?

Plants adapt to drought conditions at the physiological level by closing their stomata to minimize water loss, increasing root depth to access deeper water sources, and producing osmoprotectants to help retain cellular water.

What are the components of water potential in plants? (Select all that apply)

A. Solute potential ✓
B. Pressure potential ✓
C. Gravitational potential
D. Osmotic potential ✓

Describe how plant hormones interact with environmental cues to regulate growth.

Plant hormones regulate growth by responding to environmental cues; for example, auxins promote cell elongation in response to light (phototropism) and gravity (gravitropism), while gibberellins stimulate seed germination and flowering in response to water availability.

What is the primary pigment responsible for capturing light energy in photosynthesis?

A. Carotenoids
B. Chlorophyll ✓

C. Anthocyanins
D. Xanthophylls

Which of the following is a macronutrient essential for plant growth?

A. Iron
B. Zinc
C. Nitrogen ✓
D. Manganese

Explain the process of nutrient uptake in plant roots.

The process of nutrient uptake in plant roots begins with the absorption of water and dissolved nutrients through root hairs. This occurs primarily through osmosis and active transport, where plants utilize energy to move nutrients against their concentration gradient, often aided by mycorrhizal fungi that enhance nutrient availability.

Which of the following are factors affecting photosynthesis? (Select all that apply)

A. Light intensity ✓
B. Soil pH
C. Carbon dioxide concentration ✓
D. Temperature ✓

Which of the following are stages of plant growth and development? (Select all that apply)

A. Germination ✓
B. Vegetative growth ✓
C. Pollination
D. Flowerin ✓