

- 1) All of the following compounds are required (i.e., are used in chemical reactions) in the process of photosynthesis in green plant, EXCEPT
 - A) ATP.
 - B) NADP.
 - C) water.
 - D) oxygen.
 - E) carbon dioxide.
- 2) Albino corn has no chlorophyll or accessory pigments. You would expect albino corn plants to
 - A) capture light energy in the red end of the spectrum.
 - B) fail to thrive.
 - C) make glucose indefinitely, using stored ATP and NADPH.
 - D) carry out photosynthesis using red light.
 - E) use only the calvin cycle and not the light dependent reaction.
- 3) The energy source used in photosynthesis is
 - A) glucose.
 - B) ultraviolet light.
 - C) visible light.
 - D) air.
 - E) oxygen.
- 4) Energy is passed around different chlorophyll molecules until it reaches a specific chlorophyll molecule called the
 - A) reaction center.
 - B) thylakoid.
 - C) electron carrier molecule.
 - D) accessory pigment.
 - E) stroma
- 5) Which of the following is NOT true of chlorophyll?
 - A) It appears green in color to our eyes.
 - B) It absorbs light at the red and blue ends of the visible light spectrum.
 - C) It is the main photosynthetic pigment in plants.
 - D) It is the only light-capturing molecule involved in photosynthesis.
 - E) It reflects green wavelengths of light.
- 6) Which of the following colors of light will be most effective for growth of green plants?
 - A) green
 - B) orange and yellow
 - C) blue
 - D) red and green
 - E) red and blue
- 7) The replacement electrons for the reaction center of photosystem II come from
 - A) photosystem I.
 - B) H₂O.
 - C) glucose.
 - D) O₂.
 - E) NADPH.
- 8) What is produced in the electron transport system that is associated with photosystem II?
 - A) NADPH
 - B) ATP
 - C) C₆H₁₂O₆
 - D) O₂
 - E) CO₂
- 9) Light-dependent photosynthetic reactions produce
 - A) ATP, NADPH, O₂
 - B) ATP, NADPH, CO₂
 - C) Glucose, ATP, O₂
 - D) Glucose, ATP, CO₂
 - E) ATP, NADPH, H₂O
- 10) What is the role of water in photosynthesis?
 - A) to cool the plant
 - B) to provide electrons
 - C) to provide oxygen
 - D) to provide H₂
 - E) all of the above
- 11) Which process of photosynthesis is most directly linked to the production of ATP?
 - A) Protons pumped into the thylakoid lumen
 - B) generation of NADPH
 - C) splitting of a water molecule
 - D) fixing of carbon of carbon in the calvin cycle
 - E) production of O₂
- 12) Photosynthetic glucose production requires which of the following?
 - A) Sunlight must be striking the leaf.
 - B) Products of light-dependent reactions must be available.
 - C) The concentration of O₂ must be significantly higher than that of CO₂.
 - D) ADP must provide energy.
- 13) Which of the following statements about the light-dependent reactions of photosynthesis is FALSE?
 - A) The splitting of water molecules provides a source of electrons.
 - B) Chlorophyll (and other pigments) absorb light energy, which excites electrons.
 - C) An electron transport chain is used to create RuBP.
 - D) An electron transport chain is used to create NADPH.
 - E) ATP is manufactured.

14) Which of the following occurs during the Calvin cycle of photosynthesis?

- A) Water is split apart.
- B) Carbon dioxide is converted into sugars.
- C) Chlorophyll acts as an enzyme.
- D) Nothing occurs.
- E) Light energy is captured and converted to ATP

15. When plants are in bright sunlight:

- A) they do not carry-out photosynthesis
- B) they do not carry-out the light independent reaction of photosynthesis
- C) they do not fix carbon dioxide
- D) they concentrate protons in the thylakoid lumen
- E) they synthesize water from oxygen

18. Contrast the following three categories of life, heterotroph, chemotroph, and phototroph.

19. In most plants the light independent reaction is active only when the light reaction is active. Explain how the regulation of rubisco contributes the light independent reaction being off in the dark and on in the light.

20. Photosynthesis cycles NADP/NADPH. Explain how this cycling of NADP and NADPH function during photosynthesis.

16. When the enzyme Rubisco fixes carbon dioxide, it attaches the carbon dioxide to which of the following molecules

- A) Water
- B) Pyruvate
- C) Ribulose biphosphate
- D) NADP
- E) ADP

17. Which of the following best describes the function of the light independent reaction of photosynthesis?

- A) It is the first stage of photosynthesis.
- B) It breaks the molecular structure of water.
- C) It utilizes the energy of photons
- D) It fixes carbon dioxide and makes glucose
- E) It creates the energy rich molecules ATP and NADPH