



BIOLOGY

BOOKS - SARAS PUBLICATION

PHOTOSYNTHESIS

Exercise

1. Assertion (A): Increase in Proton gradient inside lumen responsible for ATP synthesis

Reason (R): Oxygen evolving complex of PS I

located on thylakoid membrane facing Stroma,
releases H^+ ions

- A. Both Assertion and Reason are True.
- B. Assertion is True and Reason is False.
- C. Reason is True and Assertion is False.
- D. Both Assertion and Reason are False.

Answer:



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2. Which chlorophyll molecule does not have a phytol tail?

A. Chl- a

B. Chl- b

C. Chl- c

D. Chl-d

Answer:



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3. Identify the correct sequence of flow of electrons in the light reaction is

A. PS II, plastoquinone, cytochrome, PS I, ferredoxin.

B. PS I, plastoquinone, cytochrome, PS II ferredoxin.

C. PS II, Ferredoxin, Plastogquinone, cytochrome, PS I.

D. PS I, plastoquinone, cytochrome, PS II, ferredoxin.

Answer:



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4. For every CO_2 molecule entering the C_3 cycle, the number of ATP and NADPH required is

A. $2ATP + 2NADPH$

B. $2ATP + 3NADPH$

C. $3ATP + 2NADPH$

D. $3ATP + 3NADPH$

Answer:



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5. Identify true statement regarding light reaction of photosynthesis

A. Splitting of water molecule is associate with PS I.

B. PS I, and PS II involved in the formation of NADPH + H^+

C. The reaction center of PS I is chlorophyll
a with absorption peak at 680 nm.

D. The reaction center of PS II is Chlorophyll
a with absorption peak at 700 nm.

Answer:



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6. Two groups (A & B) of bean plants 450nm &
Group B to light of wave of similar size and
same leaf area were length of 500-550nm.

Compare the placed in identical conditions.
Group A photosynthetic rate of the 2 groups
givwas exposed to light of wavelength 400
reasons.



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7. Grasses have an adaptive mechanism to
compensate photorespiratory losses Name
and describe the mechanism.



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8. In Botany class, teacher explains, Synthesis of one glucose requires 30 ATPs in C_4 plants and only 18ATPs in C_3 plants. The same teacher explains C_4 plants are more advantageous than C_3 plants. Can you identify the reason for this cont



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9. When there is plenty of light and higher concentration of O_2 , what kind of pathway does the plant undergo? Analyse the reasons.



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10. _____ is regarded as the father of modern physiology .

- A. Lavoisier
- B. Stephen Hales
- C. Van Helmont
- D. Joseph Priestly

Answer:



11. _____ explains, the vegetatino purifies the air.

- A. De saussure
- B. Dutrochet
- C. Joseph Priestley
- D. Lavoisier

Answer:



12. _____ Plotted action spectrum of photosynthesis.

A. Blackman

B. Van Neil

C. R.Hill

D. T.W. Englemann

Answer:



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13. Which of the following is a water soluble photosynthetic pigment?

- A. Phycobilins
- B. Carotenoids
- C. Chlorophyll
- D. Xanthophylls

Answer:



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14. Name the pigment which is responsible for the color of fruits.

A. Phycobilins

B. Chlorophylls

C. Carotenoids

D. Bacteriochlorophyll

Answer:



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15. Accessory pigments absorb light at more wavelengths as compared to chlorophyl

A. 1. True

B. 2.False

C.

D.

Answer:



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16. The first acceptor of CO_2 in C_4 plants is

A. Malic acid

B. Oxalaoacetic acid

C. Aspartic acid

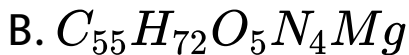
D. Phosphoenolpyruvic acid (PEP)

Answer:



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17. The formula of chlorophyll 'a' is



Answer:



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18. Reduction of NADP takes place in

A. Cyclic photophosphorylation

B. Non cyclic photophosphorylation

C. Osidative photoplhosphorylation

D. None of the above

Answer:



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19. The organelle for photorespiration is

A. Glycosomes

B. Glyoxysomes

C. Peroxisomes

D. Ribosomes

Answer:



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20. Kranz anatomy is one of the characteristics of the leaves of

A. C_1 plants

B. C_2 plants

C. C_3 plants

D. C_4 plants

Answer:



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21. Bioluminescent lamps are created from

A. C_3 plants

B. C_4 plants

C. Water cress plants

D. None of the above

Answer:



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22. Endosymbiotic hypothesis says
chloroplast evolved from

A. Virus

B. Bacteria

C. Algae

D. Fungi

Answer:



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23. Among four, highest wavelength is

A. Radio waves

B. Infrared

C. Ultraviolet

D. Gamma rays

Answer:



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24. Red drop is

- A. Drop in oxygen yield
- B. Drop in quantum yield
- C. Drop in organic yield
- D. Drop in photosynthetic yield

Answer:



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25. Red drop occurs in wavelength of

A. 492 nm

B. 535 nm

C. 586 nm

D. 680 nm

Answer:



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26. The reduction of one CO_2 requires _____ quanta of light

A. 10

B. 20

C. 30

D. 40

Answer:



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27. When chlorophyll absorbs light, it gets excited and releases

A. Oxygen

B. Water

C. Electrons

D. Energy rich compounds

Answer:



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28. Chlorophyll consists of

- A. A head of phytol and tail of four pyrrole rings
- B. A head of linked carbons and tail of four pyrrole rings
- C. A head of four pyrrole rings and tail of linked nitrogens
- D. A head of four pyrrole rings and an alcoholic phytol tail

Answer:



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29. According to chemiosmotic theory PS I and PS II are connected by

- A. Cytochrome b_6 complex
- B. Plastocyanin
- C. Plastoquinone
- D. Ferredoxin reducing substance

Answer:



30. Ferredoxin is a component of

- A. Hill reaction
- B. Photosystem-I
- C. P - 680
- D. Photosystem-II

Answer:



31. Element required for photolysis of water.

A. Mn

B. Mg

C. Fe

D. Zn

Answer:



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32. How many molecules of water should be photolysed during photolysis of water

A. 4

B. 2

C. 6

D. 1

Answer:



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33. Quantasomes are found in

- A. Cristae of mitochondria
- B. Thylakoid membrane of chloroplast
- C. Nuclear membrane
- D. Lysosome

Answer:



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34. The hydrogen donor in bacterial photosynthesis is usually

A. Water

B. Ammonia

C. Sulphur

D. Hydrogen sulphide

Answer:



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35. The correct sequence of flow of electrons in the cycle photophosphorylation

- A. PS II, Cyt B Cyt F, Ferredoxin , PSI
- B. PS I, FRS, Ferredoxikn, Cyte b_6 Cyt f
- C. PS I, Cyt f, Cyt $b - 6$ FRS Ferredoxin
- D. PS II, Ferredoxin, FRS, Cyt $b - 6$ Cyt f.

Answer:



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36. The phytol tail of chlorophyll a molecule is made up of _____ carbon

A. 10

B. 20

C. 30

D. 40

Answer:



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37. _____ is responsible for yellow colour change of leaves during autumn season.

A. Lutein

B. Phycobilins

C. Phycoerythrin

D. Luteoxanthin

Answer:



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38. The pigment phycoerythrin found in

A. Cyanophycean algae

B. Fucophcean algae

C. Rhodophycean algae

D. Chlorophycean algae

Answer:



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39. The visible spectrum ranges between

A. 300 to 2600 nm

B. 390 to 763 nm

C. 360 to 3600 nm

D. 380 to 4600 nm

Answer:



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40. Energy of the quantum is inversely proportional to

- A. Wavelength
- B. Photosynthetic rate
- C. Electrons
- D. Protons

Answer:



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41. P_{680} functions as trap centre for

A. PS I

B. PS II

C. Light reaction

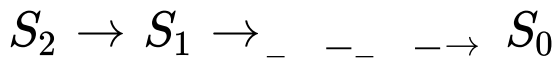
D. Dark reaction

Answer:



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42. Pathway of electron during phosphorescence is



A. P_1

B. P_2

C. T_1

D. T_2

Answer:



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43. During photosynthesis oxygen is evolved from

A. CO_2

B. Water

C. CO

D. Chlorophyll

Answer:



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44. C_4 plants require _____ ATPs for the synthesis of one glucose molecule.

A. 10

B. 20

C. 30

D. 40

Answer:



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45. Dark reaction is _____ dependent.

A. Light

B. Water

C. CO_2

D. Temperature

Answer:



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46. C_3 cycle take place in the _____ of the chloroplast

A. Stroma

B. Thylakoid membrane of chloroplast

C. Grana

D. Lumen

Answer:



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47. The most abundant protein found on earth is

- A. Elastin
- B. RUBISCO
- C. Actin
- D. Collagaen

Answer:



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48. Sugar cane is a _____ plant.

A. C_1 plants

B. C_2 plants

C. C_3 plants

D. C_4 plants

Answer:



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49. The first product of C_3 pathway is

A. PGA

B. ATP

C. NADP

D. ADP

Answer:



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50. The first phase of C_4 pathway takes place in stroma of _____ cells.

- A. Chlorophyll
- B. Mesophyll
- C. Spongy
- D. Sclerenchyma

Answer:



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51. C_3 plants require _____ ATPs for the synthesis of one glucose molecule.

A. 15

B. 16

C. 18

D. 20

Answer:



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52. Potato plant is a

A. C_1 plants

B. C_2 plants

C. C_3 plants

D. C_4 plants

Answer:



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53. _____ protects cells from photo oxidation.

A. Glycolate

B. Glyoxylate

C. Glycoprotein

D. Glycerol

Answer:



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54. Dark reactions involves only

A. Chloroplast

B. Mitochondria

C. Endoplasmic rticulum

D. Ribosomes

Answer:



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55. _____ and CO_2 are the end products of photorespiration.



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56. 'Law of limiting factor' is proposed by

A. Warburg

B. Blackman

C. Van Neil

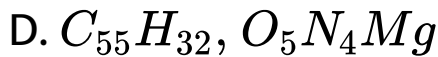
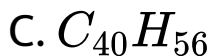
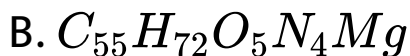
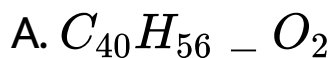
D. Huber

Answer:



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57. The chemical formula of carotene obtained from carrot is :



Answer:



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58. Photosynthetic rate is maximum in _____ and _____ region of the spectrum.

A. Blue, Red

B. Red, Far red

C. Blue, violet

D. Red, Infrared

Answer:



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59. The rate of photosynthesis decreases when there is an increase of

A. CO_2

B. O_2

C. H_2O

D. CO

Answer:



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60. _____ mineral involved in the formation of plastocyanin.

A. Cu

B. Mn

C. Mg

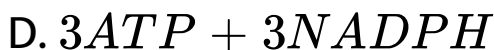
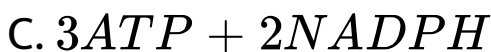
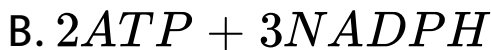
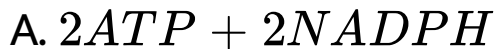
D. Ca

Answer:



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61. For every CO_2 molecule entering the C_3 cycle, the number of ATP and NADPH required is



Answer:



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62. Which chlorophyll molecule does not have a phytol tail?

A. Chl-a

B. Chl-b

C. Chl-c

D. Chl-d

Answer:



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63. Kranz anatomy is one of the characteristics of the leaves of _____

A. C_1 plants

B.

C. C_2 plants

D. C_3 plants

Answer: C_4 plants



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64. The most abundant protein found on earth is

- A. Elastin
- B. RUBISCO
- C. Actin
- D. Collagen

Answer:



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65. Identify true statement regarding light reaction of photosynthesis

A. Splitting of water molecule is associate with PS I.

B. PS I and PS II involved in the formation of



C. The reaction center of PS I is Chlorophyll

a with absorption peak at 680 nm.

D. The reaction center of PS II is Chlorophyll

a with absorption peak at 700 nm.

Answer:



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66. A tree is believed to be releasing oxygen during night time. Do you believe the truthfulness of this statement?



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67. Who showed that chlorophyll is located in chloroplast?



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68. What is spectrum?



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69. Why the absorption of blue light excites the chlorophyll to higher energy state than absorption of red light?



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70. Write the simple equation of photosynthesis as given by Van Neil.



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71. Two groups (A & B) of bean plants 450nm & Group B to light of wave of similar size and same leaf area were length of 500-550nm. Compare the placed in identical conditions. Group A photosynthetic rate of the 2 groups given was exposed to light of wavelength 400 reasons.



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72. What are the other names for dark reaction of photosynthesis?



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73. Describe the first phase of C_4 pathway.



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74. When there is plenty of light and higher concentration of O_2 , what kind of pathway

does the plant undergo? Analyse the reasons.



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75. What is absorption spectra? Give their types.



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76. Write short notes on quantosomes.



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77. How light affects photosynthesis?



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78. Where do the light and dark reaction of photosynthesis take place? Describe its structure.



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79. Describe its structure.



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80. In Botany class, teacher explains, Synthesis of one glucose requires 30 ATPs in C_4 plants and only 18ATPs in C_3 plants. The same teacher explains C_4 plants are more advantageous than C_3 plants. Can you identify the reason for this cont



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81. Write the formula of chlorophyll a,b & c.

Name one group of organism where each of them is present.



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Example

1. Match the following

- | | |
|--------------------|-----------------------|
| 1. R.Hill | - Chemiosmotic theory |
| 2. M.Melvin Calvin | - Red drop |
| 3. P.Mitchell | - Light reaction |
| 4. Emerson | - Dark reaction |



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2. Assertion: Ribosomes present in chloroplast are 70S.

Reason : The DNA present in chloroplast is linear double stranded.



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3. Assertion : Chlorophyll 'a' is called as reaction centre.

Reason : Chlorophyll 'a' is the pigment that

traps solar energy and converts it into chemical energy.



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4. Assertion: Photorespiration is completed in three cell organelles.

Reason: Peroxisome, glyoxysome and ribosome are involved in photorespiration.



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5. Assertion: Non cyclic photophosphorylation occurs in the stroma of chloroplast.

Reason: There is a continuous flow of electrons in this process.



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6. Assertion: C_4 pathway is more efficient than the C_3 pathway.



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7. Where do plants get their energy to grow?



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8. How much of carbon is fixed annually by photosynthesis and how much of dry photosynthesis and how much of dry organic matter is produced?



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9. What did Van Helmont find out with his experiment?



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10. Who explained the importance of chlorophyll in photosynthesis?



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11. Who explained the importance of water in the process of photosynthesis?



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12. What did the following scientists find out regarding photosynthesis?



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13. Write the simple equation of photosynthesis as given by Van Neil.



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14. Define photosynthesis.



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15. Write the currently accepted equation of photosynthesis



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16. Write the formula of chlorophyll a,b & c.
Name one group of organism where each of them is present.



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17. Prove by an experiment that Oxygen is released during photosynthesis.



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18. What is thylakoid?



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19. Define granum.



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20. Why carotene pigments are called shield pigments?





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21. Who showed that chlorophyll is located in chloroplast?



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22. The visible spectrum ranges between



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23. List the radiations present in electromagnetic spectrum.



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24. Name the common in nitro hydrogen acceptors.



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25. List the conclusions obtained by Hill's reaction.



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26. Define photosynthesis.



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27. What is ground state?



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28. Why the absorption of blue light excites the chlorophyll to higher energy state than absorption of red light?



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29. What is excited state?



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30. What do you know about the immediate emission of absorbed radiations?



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31. What do you know about the delayed emission of absorbed radiations.?



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32. What is substrate level phosphorylation?



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33. What is phosphorylation?



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34. What is photophosphorylation?



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35. What is photophosphorylation?



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36. What are the other names for dark reaction of photosynthesis?



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37. Define photorespiration.



[Watch Video Solution](#)

38. What is CO_2 compensation point?



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39. Name the internal factors affecting photosynthesis.



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40. Write notes on bacterial photosynthesis.



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41. Explain the separation of chloroplast pigments by paper chromatography method.



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42. Mention the properties of light.



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43. What is absorption spectra? Give their types.



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44. Briefly explain the chemiosmotic theory.



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45. What is the significance of CAM cycle?



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46. Write short notes on quantosomes.



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47. List out the external factors affecting photosynthesis.



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48. What is the role of light in photosynthesis?



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49. How light affects photosynthesis?



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50. How O_2 affects photosynthesis?



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51. What is the role of water in photosynthesis?



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52. How minerals affect photosynthesis?



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53. What is the role of temperature in photosynthesis?



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54. Explain the modern concept of photosynthesis.



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55. A tree says " I can live without you, But you cannot live without me". Is the statement true?

Give reasons on the basis of ecosystem.





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56. Where do the light and dark reaction of photosynthesis take place? Describe its structure.



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57. Describe the structure of primary pigment molecule.



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58. Mention the minerals used in the biosynthesis of Chlorophyll a.



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59. Write about the pigments which give colour to the plant parts like fruits and flowers.



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60. Write notes on phycobilins.



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61. Red drop is



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62. Write notes on Emerson's enhancement effect.



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63. Describe water oxidising clock.



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64. What is photophosphorylation?



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65. Explain non-cyclic photophosphorylation.



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66. List out the bioenergetics of light reaction.



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67. What is biosynthetic phase of photosynthesis? Explain its phases.



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68. Which type of metabolism takes place in succulent plants? Explain.



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69. Define photorespiration.



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70. Define photosynthesis.



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71. What is thylakoid?



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[Watch Video Solution](#)

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