BIOLOGY

BOOKS - S DINESH & CO BIOLOGY (HINGLISH)

PHOTOSYNTHESIS

Mcq

1. How much energy is utilised in the synthesis of one gram mole of glucose

A. 673 kcal

B. 686 kcal

C. 666 kcal

D. 696 kcal.

Answer: B

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2. The number of light quanta required for evolution of one molecule of oxygen is called

A. Oxygen yield

B. Photosynthetic yield

C. Quantum yield

D. Organic yield

Answer: C

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3. Red drop is

A. Drop in oxygen yield

B. Drop in quantum yield

C. Drop in organic yield

D. Drop in photosynthetic yield.

Answer: D

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4. Red drop occurs in wavelength of

A. 492 nm

B. 535 nm

C. 586 nm

D. 680 nm.

Answer: D

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5. Emerson effect indicates the existence of

A. Two pigment systems

B. Two photosynthetic units

C. Two photophosphorylations

D. None of the above.

Answer: A

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6. In light phase of photosynthesis there is formation of

A. ATP

B. $NADPH_2$

C. Both ATP and $NADPH_2$

D. Carbohydrates.

Answer: C

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7. The photosynthetic unit having 250 chlorophyll molecules is called

A. Photon

B. Quantum

C. Quantasome

D. Oxysomes.

Answer: C

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8. Photosynthesis proceeds in sequence of

A. Dark phase and light phase

B. Light phase alone

C. Light phase and dark phase

D. Dark phase alone.

Answer: C

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9. Light phase consists of

A. Two photochemical reactions

B. Two photosynthetic units

C. Two chloroplast parts

D. None of the above.

Answer: A

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10. Light energy is converted into chemical energy through the formation of

A. $NADPH_2$

B. ATP

C. ATP and $NADPH_2$

D. None of the above.

Answer: C

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11. Photophosphorylation consists of

A. Cyclic and non-cyclic phosphorylation

B. Oxidative phosphorylation

C. Substrate phosphorylation

D. None of the above.

Answer: A

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12. Stroma is the ground matrix of

A. Lysosomes

B. Oxysomes

C. Ribosomes

D. Chloroplast.

Answer: D

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13. In C_4-plants, photosystem II is absent in chloroplasts of

A. Mesophyll cells

B. Bundle sheath cells

C. Palisade cells

D. Spongy cells.

Answer: B

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14. In C_4-Plants, Calvin cycle enzymes are absent in

A. Mesophyll chloroplasts

B. Bundle sheath chloroplasts

C. Guard cell chloroplasts

D. Epidermal chloroplasts.

Answer: A

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15. The carbon dioxide acceptor in CAM plants is

A. Malic acid

B. Oxalo-acetic acid

C. Pyruvic acid

D. Phosphoenol pyruvic acid.

Answer: D

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16. The first stable product in CAM/C_4 plants is

A. Starch

B. Oxalo-acetic acid

C. Sugar

D. Malic acid.

Answer: D

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17. The co-oprative photosynthesis is found in

A. C_4-plants

B. C_3-plants

C. C_2-plants

D. Succulents.

Answer: A

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18. The sugar formed at photosynthetic site is

A. Utilised

B. Stored

C. Transported

D. Assimilated.

Answer: C

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19. When chlorophyll absorbs light, it gets excited and emits (releases)

A. Oxygen

B. Water

C. Electrons

D. Energy rich compounds.

Answer: C

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20. The excess energy of electron is used in the synthesis of

A. Organic compounds

B. ATP from ADP and iP

C. $NADPH_2$ from $NADP$

D. None of the above.

Answer: B

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21. The excess energy of electron is used in the synthesis of ATP and the process is called

A. Oxidative phosphorylation

B. Substrate phosphorylation

C. Photophosphorylation

D. Phosphorylation

Answer: D

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22. Which of the following equations sums up photosynthetic reaction most accurately

A. $CO + H_2O \rightarrow CH_2O + O_2$

B. $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

C. $6CO_2 + 12H_2O \rightarrow C_6H_{12}O_6 + 6O_2 + H_2O$

D. $6CO_2 + 12H_2O \xrightarrow[\text{Chlorophyll}]{\text{Light}} C_6H_{12}O_6 + 6O_2 + 6H_2O$

Answer: D

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23. Kranz anatomy is found in

A. Stems of C_4 plants

B. Stems of C_3 plants

C. Leaves of C_4 plants

D. Leaves of C_3 plants.

Answer: C

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24. $C_{40}H_{56}$ is the empirical formula of

A. Chlorophyll b

B. Carotene

C. Xanthophyll

D. Anthocyanin.

Answer: B

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25. $C_{40}H_{56}O_2$ is an empirical formula of a

A. Xanthophyll

B. Carotene

C. Anthocyanin

D. Chlorophyll.

Answer: A

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26. Calvin cycle operates in chloroplasts. Where does Hatch-Slack pathway occur

A. Mitochondria

B. Golgi bodies

C. Chloroplasts

D. Cytoplasm.

Answer: C

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27. Emerson effect is related to

A. Decrease in photosynthesis in presence of high light intensity

B. Decrease in photosynthesis when lights of two different wavelengths are provided together

C. Increase in photosynthesis in presence of monochromatic light

D. Increase in photosynthesis when lights of two different wavelengths are provided together.

Answer: D

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28. Which one is directly involved in light reaction of photosynthesis

A. Chlorophyll a

B. Chlorophyll b

C. Carotenoids

D. All the above.

Answer: A

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29. Autumnal leaf colour is due to

A. Chlorophyll a

B. Carotenoids

C. Anthocyanins

D. Betacyanin.

Answer: B

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30. Photosynthetic pigments are located in the chloroplast in

A. Intrathylakoid space

B. Thylakoid membranes

C. Intermembrane space

D. Inner membrane of envelope

Answer: B

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31. Electron carriers involved in photophosphorylation are located in

A. Outer chloroplast membrane

B. Inner chloroplast membrane

C. Stroma

D. Thylakoid membranes.

Answer: D

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32. Source of protons within the chloroplasts is

A. Water

B. Excited chlorophyll

C. Carbon dioxide

D. Rubisco.

Answer: A

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33. In cyclic photophosphorylation, the electron released by reaction centre (P_{700}) is ultimately accepted by

A. Ferredoxin

B. $NADP^+$

C. Reaction centre

D. Plastocynanin.

Answer: C

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34. In non-cyclic photophosphorylation the electron released by P_{680} is replaced by

A. Plastoquinone

B. Water

C. CO_2

D. $NADP^+$

Answer: B

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35. Plants do not store carbohydrate as glucose but do so as starch because glucose

A. Is unstable

B. Attracts herbivores

C. Will change nucleic acids

D. Alters osmotic balance.

Answer: D

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36. Decline in quantum yield was noticed by Emerson at a wavelength of

A. 400-450 nm

B. 600-650 nm

C. 650-680 nm

D. more than 680 nm.

Answer: D

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37. Chemosynthetic bacteria obtain energy from

A. Sun

B. Infra-red rays

C. Organic substances

D. Inorganic chemicals.

Answer: D

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38. Photosynthetic autotrophs get their energy requirement from

A. Heat

B. Light

C. Inorganic chemicals

D. Organic chemicals.

Answer: B

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39. A heterotroph obtains its carbon supply from

A. Organic chemicals

B. CO_2

C. Methane

D. Cyanide.

Answer: A

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40. In 1772, Joseph Priestley demonstrated that

A. Plants foul the air

B. Animals purify the air during day time

C. Plants and animals restore air for each other

D. Plants get killed in the air produced by animals.

Answer: C

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41. The First hypothesis that oxygen released during photosynthesis is derived from water, was proposed by

A. Engelmann

B. Priestley

C. Van Niel

D. Blackman.

Answer: C

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42. Dark reactions of carbon assimilation occur in

A. Cytoplasmic matrix

B. Mitochondria

C. Leucoplasts

D. Chloroplasts.

Answer: D

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43. $NADPH$ is produced in photosynthesis during

A. Dark reaction

B. Non-cyclic photophosphorylation

C. Pseudocylic photophosphorylation

D. Cyclic photophosphorylation.

Answer: B

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44. Energy required for ATP synthesis in PSII comes from

A. Proton gradient

B. Electron gradient

C. Reduction of glucose

D. Oxidation of glucose

Answer: A

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45. Excited pigment molecule shifts an electron in an outer orbit having

A. Less energy

B. More energy

C. Lesser spin

D. More spin.

Answer: B

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46. 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: D

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47. Electron donor to PS I is

A. Ferredoxin

B. FeS centre

C. Plastoquinone

D. Plastocyanin.

Answer: D

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48. Photosynthesis (nourishment in light) was discovered by

A. Stephen Hales

B. Priestley

C. Ingenhousz

D. Van Mayer.

Answer: C

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49. Chlorophyll was first extracted by

A. Van Mayer

B. Pelletier and Caventou

C. Willstatter and Stoll

D. Senebier.

Answer: B

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50. The source of hydrogen for carbon assimilation is

A. $NADPH$

B. $FADH_2$

C. H_2O

D. $RuBP$

Answer: A

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51. The number of carbon atoms present in ribulose biphosphate is

A. 6

B. 5

C. 4

D. 3

Answer: B

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52. Wavelength of light least effective in photosynthesis is

A. Violet

B. Blue

C. Green

D. Red.

Answer: C

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53. Plants with high light compensation point are

A. C_3 plants

B. Sun plants

C. Shade plants

D. Mesophytes.

Answer: B

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54. C_4 plants are adapted to

A. Temperate humid climate

B. Tropical humid climate

C. Temperate dry climate

D. Tropical dry climate.

Answer: D

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55. In C_4 plants, synthesis of sugars occurs in

A. Mesophyll cells

B. Bundle sheath cells

C. Spongy parenchyma cells

D. Palisada parenchyma cells.

Answer: B

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56. Chemistry of photosynthetic pigments was first studied by

A. Willstatter and Stoll

B. Pellebtier and Caventou

C. Priestley

D. Engelmann.

Answer: A

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57. Who discovered that green plant parts and light are essential for photosynthesis ?

A. Engelmann

B. Ingenhousz

C. Sachs

D. Priestley.

Answer: B

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58. Action spectrum of photosynthesis was first studied by

A. Blackman

B. Von Mayer

C. Engelmann

D. Boussingault.

Answer: C

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59. What is the contribution of Boussingault in the study of photosynthesis ?

A. Light is essential for photosynthesis

B. Amount of CO_2 absorbed is equal to O_2 evolved

C. CO_2 is raw material for photosynthesis

D. Oxygen is bye-product of photosynthesis.

Answer: B

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60. Who stated that in photosynthesis light energy is converted into chemical energy ?

A. R. Mayer

B. Willstatter and stoll

C. Arnon

D. Calvin.

Answer: A

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61. Which of the following does not affect light phase

A. chlorophyll

B. Water

C. Cytochrome

D. Temperature.

Answer: D

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62. Which one of the following is limiting rate of photosynthesis in nature

A. Light

B. CO_2

C. O_2

D. Both A and B

Answer: B

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63. During day time the green plants show a ratio of CO_2 consumption to CO_2 production of

A. $1:1$

B. $5:1$

C. $10:1$

D. $20:1.$

Answer: C

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64. Dry weight of leaf is maximum during

A. Morning

B. Noon

C. Afternoon

D. Night.

Answer: C

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65. Q_{10} refers to

A. Temperature quotient

B. Respiratory quotient

C. Compensation point

D. Time factor

Answer: A

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66. In PS I, the carrier that picks up electrons from P_{700} is

A. Fe protein

B. Fe-S protein

C. Fe-Cu protein

D. Fe-Mg protein.

Answer: B

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67. Which is correct for photosynthetic organs

A. Light Energy $\rightarrow$ Heat $\rightarrow$ chemical Energy

B. Chemical Energy $\rightarrow$ Light Energy $\rightarrow$ Heat

C. Heat $\rightarrow$ Light Energy $\rightarrow$ Chemical energy

D. Light Energy $\rightarrow$ Chemical energy $\rightarrow$ Heat.

Answer: D

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68. Herbicide $DCMU$ [(3-C, 3, 4-dichlorophenyl) -1, 1-dimethyl urea] kills plants due to stoppage of

A. Photophosphorylation

B. Rubisco activity

C. Electron transport

D. O_2-evolution.

Answer: D

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69. High CO_2 compensation point is found in

A. C_3 plants

B. C_4 plants

C. CAM plants

D. Lichens.

Answer: A

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70. Chloroplasts are agranal in

A. Algae

B. Bundle sheath cells of C_4 plants

C. Mesophyll cells of C_4 plants

D. Both A and B.

Answer: D

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71. Illuminated isolated chloroplasts release O_2 in the absence of CO_2. Which will increase oxygen output ?

A. H_2O

B. $NADP^+$

C. NAD^+

D. Green light.

Answer: B

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72. Rate of photosynthesis is

A. Equal to that of respiration

B. Less than that of respiration

C. Depends upon chlorophyll content

D. Faster than that of respiration.

Answer: D

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73. In an experiment on O_2 evolution by photosynthesising Hydrilla plant, a pinch of sodium bicarbonate is added to water. The rate of photosynthesis or O_2 evolution will

A. Increase

B. Decrease

C. Stop

D. Not be affected.

Answer: A

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74. An illuminated plant is provided with $0.03\ \%\ CO_2$. The plant will

A. Die

B. Just survive

C. Show normal photosynthesis

D. Have reduced respiration.

Answer: C

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75. Photosynthesis will be highest when the plant is exposed to

A. Continuous strong light

B. Continuous weak light

C. Alternate strong and weak light

D. Intermittent light.

Answer: D

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76. Which helped in confirming that oxygen evolved in photosynthesis comes from water

A. $H_2.^{18}O$

B. $.^{14}CO^2$

C. $.^{15} NO_3$

D. $.^{3} H_2O.$

Answer: A

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77. Photolysis of water involves

A. Excitement of water

B. Evolution of oxygen

C. Breakdown of water by light

D. Splitting of water into its ions, H^+ and OH.

Answer: C

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78. the radiant energy absorbed by carotenoids is

A. Lost as heat

B. Transferred to chlorophylls

C. Re-emitted as fluorescence or phosphorescence

D. Used to perform photochemical act.

Answer: B

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79. the most effective wavelength of light participating in photosynthesis is

A. 450-520 nm

B. 700-760 nm

C. 660-700 nm

D. 520-560 nm.

Answer: C

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80. The by-product of photosynthesis is

A. CO_2

B. H_2O

C. Glucose

D. O_2.

Answer: D

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81. The oxygen in photosynthesis is released from

A. CO_2

B. H_2O

C. Carbohydrate

D. Chlorophyll.

Answer: B

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82. The First scientist to find out the role of light in photosynthesis was

A. Ingenhousz

B. Senebier

C. Priestley

D. Sachs.

Answer: A

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83. the empirical formula for chlorophyll a is

A. $C_{35}H_{72}O_5N_4Mg$

B. $C_{65}H_{70}O_6N_4Mg$

C. $C_{55}H_{72}O_5N_4Mg$

D. $C_{45}H_{70}O_6N_4Mg$.

Answer: C

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84. The process of taking in CO_2 by plants and releasing O_2 is component of

A. Transpiration

B. Respiration

C. Endosmosis

D. Photosynthesis.

Answer: D

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85. During photosynthesis O_2 is liberated by oxidation of

A. H_2O

B. CO_2

C. Phosphohlyceralbehyde

D. None.

Answer: A

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86. Photophosphorylation is the process in which

A. CO_2 and O_2 unite

B. Phosphoglyceric acid is produced

C. Aspartic acid is formed

D. Light energy is converted into chemical energy through production of ATP.

Answer: D

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87. the first step in photosynthesis is the

A. Joining of 3-carbon atom to form Glucose

B. Formation of ATP

C. Ionization of water

D. Excitement of an electron of chlorophyll by photon of light.

Answer: D

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88. when cell ceonverts light energy into chemical energy, which of the following reaction would take place.

A. $ADP + iP = ATP$

B. $ATP - iP = ADP$

C. $AMP + iP = ADP$

D. $GDP + iP = GTP.$

Answer: A

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89. Photophosphorylation means synthesis of

A. ATP from ADP

B. $NADP$

C. ADP from ATP

D. $PGA.$

Answer: A

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90. ATP formation during photosynthesis is

A. Phosphorylation

B. Photophosphorylation

C. Oxidative phosphorylation

D. None of the above.

Answer: B

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91. The process in which water is split during photosynthesis is

A. Photolysis

B. Hydrolysis

C. Plasmolysis

D. Hemolysis.

Answer: A

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92. Besides water and light which is more essential as a raw material for food formation

A. CO_2

B. NAD

C. O_2

D. Mineral salts.

Answer: A

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93. In pigment system II, active chlorophyll is

A. P_{680}

B. P_{700}

C. P_{673}

D. P_{720}

Answer: A

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94. the site for light reaction is

A. Grana

B. Stroma

C. ER

D. Cytoplasm.

Answer: A

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95. Assimilatory power produced in Hill reaction and used in Blackman's reaction refers to

A. Generation of ATP and $NADPH$

B. Reduction of CO_2

C. Splitting of water

D. Disintegration of plastids.

Answer: A

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96. the number of chlorophyll molecules in a quantasome id

A. 50 - 100

B. 200 - 250

C. 300 - 400

D. 500 - 600

Answer: B

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97. The process of photophosphorylation was discovered by

A. Calvin

B. Arnon

C. Priestley

D. Warburg.

Answer: B

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98. Which colour of light gives maximum absorption peak of chlorophyll a

A. Red

B. Blue

C. Green

D. Yellow.

Answer: B

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99. Two pigment system theory of photosynthesis was proposed by or Conept of evidence for existence two photosystem is

photosynthesis was given by

A. Hill

B. Blackman

C. Emerson

D. Arnon.

Answer: C

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100. Dark reaction in photosynthesis is called so because

A. It can occur in dark alone

B. It does not require direct light energy

C. It cannot occur during day time

D. It occurs more rapidly at night.

Answer: B

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101. In case of C_4-pathway

A. CO_2 combines with PGA

B. CO_2 combines with PEP

C. CO_2 first combines with $RuBP$

D. CO_2 combines with RMP.

Answer: B

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102. which one is a C_4-plant ?

A. Papaya

B. Pea

C. Potato

D. Maize/Corn/Sorghum.

Answer: D

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103. The first carbon fixation in C_4 pathway occurs in chloroplasts of

A. Guard cells

B. Mesophyll

C. Bundle sheath

D. All the above.

Answer: B

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104. Law of limiting factors in photosynthesis was given by:

A. R. Hill

B. Calvin

C. Krebs

D. Blackman.

Answer: D

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105. C_4 cycle was discovered by

A. Hatch and Slack

B. Calvin

C. Hill

D. Arnon.

Answer: A

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106. Which one is most efficient converter of sunlight ?

A. Sugarcane

B. Rice

C. Wheat

D. Papaya.

Answer: A

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107. Dark reaction of photosynthesis occurs in

A. Grana

B. Stroma

C. Matrix

D. Cytoplasm.

Answer: B

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108. In C_3 plants first stable product of photosynthesis during reaction is

A. PGA

B. $PGAL$

C. $RuBP$

D. Oxalo-acetic acid

Answer: A

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109. The isotope of carbon used extensively for studies in photosynthesis is

A. $._{}^{13}C$

B. $._{}^{14}C$

C. $._{}^{15}C$

D. $._{}^{16}C$

Answer: B

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110. Red drop discovered by Emerson is due to disruption of photochemical activity of

A. Carotenoids

B. PS I

C. PS II

D. Both B and C.

Answer: C

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111. The first carbon dioxide acceptor in C_4-plants is

A. Phosphoenolpyruvate

B. Ribulose 1, 5-bisphosphate

C. Oxalo-acetic acid

D. Phosphoglyceric acid.

Answer: A

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112. The carbon dioxide acceptor in Calvin cycle/ C_3- plants is

A. Phospho-enol pyruvate (PEP)

B. Ribulose 1, 5-bisphosphate $(RuBP)$

C. Phospoglyceric acid (PGA)

D. Ribulose monophosphate (RMP).

Answer: B

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113. The process of photosynthesis is

A. Reductive, exergonic and catabolic

B. Reductive, endergonic and catabolic

C. Reductive, exergonic and anabolic

D. Reductive, endergonic and anabolic.

Answer: D

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114. 85-90% of all photosythesis of the carried out by

or

The maximum evolution of oxygen is by greated produces of organic matter

A. Large trees with milions pf branches and leaves

B. Algae/photoplankton of the ocean

C. Chlorophyll containing ferns of the forest

D. Scientists in the loboratories.

Answer: B

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115. Glycolate accumulates in chloroplasts when there is

A. High CO_2

B. Bright light

C. Low temperature

D. Low CO_2

Answer: D

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116. The C_4-plants are different from the C_3-plants with reference to the

A. The substance that accepts CO_2 in carbon assimilation

B. Types of end product of photosynthesis

C. The number of NADPH that are consumed in preparing sugar

D. Types of pigments involved in photosynthesis

Answer: A

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117. Which one of the following is not a limiting factor for photosynthesis

A. O_2

B. CO_2

C. Chlorophyll

D. Light.

Answer: A

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118. Moll's experiment show

A. Unequal transpiration from two surfaces of leaf

B. CO_2 is essential for photosynthesis

C. Relation between transpiration and absorption

D. Chlorophyll is essential for photosynthesis.

Answer: B

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119. The precentag of light energy utilized for photosynthesis by higher plants is

A. 100

B. 50

C. 10

D. 1-2.

Answer: D

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120. Which of the following is least effective in photosynthesis

A. Sunlight

B. Red light

C. Blue light

D. Green light.

Answer: D

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121. Alage used by Calvin and associates for photosynthetic reserch is

or

The experimental material that has largely been responsible for the making rapiad advances in research on photosynthesis is

or

Warbug studied his effect on .

A. Chlamydomonas

B. Chlorella

C. Spinach leaf

D. Hydrilla.

Answer: B

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122. Correct equation for photosynthesis is

A. $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

B. $6CO_2 + 6H_2O \rightarrow C_6 + H_{12}O_6 + 6O_2$

C. $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

D. $6CO_2 + 10H_2O \rightarrow C_6H_{12}O_6 + O_2 + 4H_2O.$

Answer: C

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123. Rate of photosynthesis is independent of

A. Intensity of light

B. Duration of light

C. Quality of light

D. Temperature.

Answer: B

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124. PEP is primary CO_2 acceptor in

A. C_4-plants

B. C_3-plants

C. C_2-plants

D. Both A and B.

Answer: A

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125. Which one directly transfers electrons to $NADP^+$ during light reaction ?

A. PS I

B. PS II

C. Cytochromes

D. Plastocyanim.

Answer: A

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126. Compensation point is the value of a factor where there is

A. Beginning of photosynthesis

B. Little photosynthesis

C. Photosynthesis equal to rate of respiration

D. Neither photosynthesis nor respiration.

Answer: C

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127. Maize, sugarcane and some other tropical plants have high efficiency of CO_2 fixation because they operate

A. Calvin cycle

B. Hatch-Slack cycle

C. TCA cycle

D. PP pathway.

Answer: B

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128. Which one of the following is the common storage product of photosynthesis

A. Protein

B. Fat

C. Starch

D. Sucrose/glucose.

Answer: C

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129. What is true for photosynthesis

A. Both carbon dioxide and water are oxidised

B. Both carbon dioxide and water are reduced

C. Carbon dioxide is oxidised and water reduced

D. Carbon dioxide is reduced and water oxidised.

Answer: D

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130. Leaves are green because they

A. Absorb green light

B. Do not absorb but reflect green light

C. Utilise green light

D. Absorb and reflect green light.

Answer: B

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131. Cyclic photosphorylation produces

A. $NADPH$

B. ATP and $NADPH$

C. ATP, $NADPH$ and O_2

D. ATP only.

Answer: D

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132. Bacterial photosynthesis involves.....

A. PS I

B. PS II

C. Both PS I and PS II

D. None of them.

Answer: A

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133. Algae aften float on surface of water during day but sink down during night due to

A. Evolution and trapping of oxygen bubbles during the day in their photosynthesis

B. Becoming light as they consume most of their food in the night

C. Warming action of sun during the day

D. Release of absorbed air by warming of water.

Answer: A

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134. Both respiration and photosynthesis require

A. Sunlight

B. Green cells

C. Cytochromes

D. Organic substarate.

Answer: C

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135. Isotopes popularly know to have been used in the study of photosynthesis are

or

Which of the following isotope of carbon was by Calvin to trace the path of carbon in photosynthesis

A. $._{}^{11}C$ and $._{}^{32}P$

B. $._{}^{15}C$ and $._{}^{32}P$

C. $._{}^{16}C$ and $._{}^{15}N$

D. $._{}^{14}C$ and $._{}^{18}O$.

Answer: D

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136. In C_4 plants, synthesis of sugars/final CO_2 fixation occurs in

A. Palisade cells

B. Spongy cells

C. Undifferentiated mesophyll cells

D. Bundle sheath cells

Answer: D

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137. The products of photochemical reaction are

A. O_2, ATP and $NADPH$

B. O_2

C. ATP and $NADPH$

D. Organic compounds especially carbohydrates.

Answer: A

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138. The substrate for photorespiration is

A. Phosphoglyceric acid

B. Glycolate

C. Serine

D. Glycine.

Answer: B

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139. Carbon dioxide joins the photosynthetic pathway in

A. PS I

B. PS II

C. Light reaction

D. Dark reaction.

Answer: D

140. Nobel Prize was awarded to the scientist for discovering the pathway of carbon assimilation

A. Watson

B. Krebs

C. Calvin

D. Parnas.

Answer: C

141. A Photosynthetic organism which does not release oxygen is

A. Blue-green alga

B. Green sulphur bacterium

C. Green alga

D. Algal component of lichen.

Answer: B

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142. PS II contains a non-chlorophyllous pigment in blue-green algae

A. β-carotene

B. Zeaxanthin

C. Phycocyanin

D. Cytochrome c.

Answer: C

Watch Video Solution

143. The evidence that during photosynthesis oxygen comes from water

A. Photosynthesis bacteria employ H_2S and CO_2 to form carbohydrates, water and sulphur

B. Isolated illuminated chloroplasts release oxygen if provided with potassium ferrocyanide

C. Isotopic $.^{18}O$ provided as $H_2.^{18}O$ appears as $.^{18}O_2$ liberated in photosynthesis

D. All the above.

Answer: D

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144. Formation of ATP in photosynthesis and respiration is an oxidation process which utilise the energy from

A. Cytochromes

B. Ferredoxin

C. Electrons

D. Carbon dioxide.

Answer: C

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145. Photosynthetic pigments found in the chloroplasts occur in

A. Thylakoid membranes

B. Plastoglobules

C. Matrix

D. Chloroplast envelope.

Answer: A

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146. Which "photosythetic bacteria" possess both PS I and PS II

A. Purple sulphur bacteria

B. Cyanobacteria

C. Purple nonsulphur bacteria

D. Green sulphur bacteria.

Answer: B

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147. C_4 plants are also known as

A. Calvin type

B. Calvin-Bassham type

C. Hatch and Slack type

D. Emerson type.

Answer: C

Watch Video Solution

148. In C_4 plants, Calvin cycle operates in

A. Stroma of bundle sheath chloroplasts

B. Grana of bundle sheath chloroplasts

C. Grana of mesophyll chloroplasts

D. Stroma of mesophyll chloroplasts

Answer: A

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149. Greatest producers of organic matter are

A. Crop plants

B. Forests

C. Plants of the land area

D. Phytoplankton of oceans.

Answer: D

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150. C_4 Plants belong to

A. Gramineae

B. Monocots

C. Dicots

D. Both monocots and dicots.

Answer: D

Watch Video Solution

151. Sugarcane show high efficiency of CO_2 fixation because of

A. Calvin pathway

B. EMP pathway

C. Hatch and Slack pathway

D. TCA cycle.

Answer: C

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152. Which is sensitive to longer wavelengths of light

A. PS II

B. PS I

C. Phosphorylation

D. Photolysis.

Answer: B

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153. The size of chlorophyll molecule is

A. Head $15 \times 15\tilde{A}...$, tail $25\tilde{A}...$

B. Head $20 \times 20\tilde{A}...$ tail $25\tilde{A}...$

C. Head $15 \times 15\tilde{A}...$, tail $20\tilde{A}...$

D. Head $10 \times 12\tilde{A}...$, tail $15\tilde{A}...$

Answer: C

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154. Dark reactions of photosynthesis occur in

A. Granal thylakoid membranes

B. Stromal lamella membranes

C. Stroma outside photosynthetic lamellae

D. Periplastidial space.

Answer: C

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155. The first experiment on photosynthesis in flashing light were carried out by

A. Hill

B. Calvin

C. Blackman

D. Emerson and Arnold.

Answer: D

Watch Video Solution

156. Kranz anatomy is typical of

A. C_4 plants

B. C_3-plants

C. C_2-plants

D. CAM plants.

Answer: A

Watch Video Solution

157. Pigment system I performs independently

A. Non-cyclic photophosphorylation

B. Cyclic photophosphorylation

C. Oxidative phosphorylation

D. Photolysis.

Answer: B

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158. Algae employed by Calvin et al in experiments on photosynthesis belong to

A. Euglena and Scendesmus

B. Chara

C. Chlamydomonas and Chlorella

D. Chlorella and Scenedesmus.

Answer: D

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159. Chlorophyll b is

A. $C_{54}H_{70}O_6N_4Mg$

B. $C_{55}H_{70}O_6N_4Mg$

C. $C_{55}H_{72}O_5N_4Mg$

D. $C_{45}H_{72}O_5N_4Mg$.

Answer: B

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160. cyclic photosphorylation is carried out by

A. PS I only

B. PS II only

C. Both A and B

D. Photolysis and PS II.

Answer: A

Watch Video Solution

161. Maximum O_2 evolution occurs from

A. Forests

B. Marine phytoplankton

C. Crops

D. Land mass.

Answer: B

Watch Video Solution

162. Which technique has helped in inverstigation of calvin cycle ?

A. X-ray crystallography

B. X-ray technique

C. Radioactive isotope technique

D. Intermittent light.

Answer: C

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163. Which one of the following does not ferform C_4 photosynthesis ?

A. Saccharum

B. Zea mays

C. Triticum aestivum

(= T. vulgare)/(Crotalaria)

D. Euphorbia milli (=E. splendens).

Answer: C

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164. During monsoon, the rice crop of eastern states of India shows lesser yield due to limiting factor of

A. CO_2

B. Light

C. Temperature

D. Water.

Answer: B

Watch Video Solution

165. Photosynthetic enhancement with flashing light was first observed by

A. Benson and Calvin

B. Hill and Calvin

C. Hatch and Slack

D. Emerson and Arnold.

Answer: D

Watch Video Solution

166. Path of dark reaction of photosynthesis was traced through the use of

A. $._{}^{32}P$

B. $._{}^{14}CO_2$

C. $._{}^{18}O_2$

D. X-rays.

Answer: B

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167. Chief functions of leaves are

A. Transpiration and photosynthesis

B. Respiration and photosynthesis

C. Respiration and digestion

D. Respiration and transpiration.

Answer: A

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168. At high oxygen concentration, the rate of photosynthesis decreases due to

A. Warburg effect

B. Pasteur effect

C. Emerson effect

D. Richmond Lang effect.

Answer: A

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169. Quantosomes occur in

A. Chloroplasts/Grana

B. Mitochondria

C. Nucleus

D. Lysosmes.

Answer: A

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170. Most effective wavelength of light for photosynthesis is

A. Green

B. Violet

C. Red

D. Yellow.

Answer: C

Watch Video Solution

171. The enzyme that catalyses carbon dioxide fixation in C_4 plants is

A. $RuBP$ carboxylese

B. PEP carboxylase

C. Carbonic anhydrase

D. Carboxydismutase.

Answer: B

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172. Ferredoxin is a constituent of

A. PS I

B. PS II

C. Hill reaction

D. P_{680}.

Answer: A

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173. Photo-oxidation or photolysis of water (in photosynthesis) occurs in association of

A. Cytochrome B_6

B. Plastocyanin

C. PS II

D. PS I.

Answer: C

Watch Video Solution

174. Photosystem II occurs in

A. Stroma

B. cytochrome

C. Grana thylakoids

D. Mitochondrial surface.

Answer: C

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175. All types of plastids possess essentialy the same structure because they

A. Perform the same function

B. Store food material like starch, fat and protein

C. Occucr in aerial parts

D. Can transform from one form to another.

Answer: D

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176. Chlorophyll a occurs in

A. All photosunthetic autotrophs

B. In all higher plants

C. All oxygen liberating autotrophs

D. All plants except fungi.

Answer: C

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177. Bacterial photosynthesis differs from that of higher plants in

A. Not liberating oxygen

B. Non-requirement of light

C. Non-fixation of energy

D. Requirement of host organism.

Answer: A

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178. ATP is

A. Adenine triphosphate

B. Adenosine tetraphosphate

C. Adenosine triphosphate

D. Asdenine tetraphosphate.

Answer: C

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179. For synthesis of a molecule of glucose, the requirement of ATP and $NADPH$ is respectively

A. 15 and 10

B. 33 and 22

C. 12 and 8

D. 18 and 12.

Answer: D

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180. Food is transported to different parts of plant through

A. Xylem

B. Phloem

C. Pith

D. Cortex.

Answer: B

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181. Translocation of carbohydrate nutrients usually occurs in the form of

A. Glucose

B. Maltose

C. Starch

D. Sucrose.

Answer: D

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182. Which one dies first when a ring of bark is removed

A. Shoot

B. Root

C. None

D. Both shoot and root die simultaneously.

Answer: B

Watch Video Solution

183. Complete girdling ultimately kills the tree due to

A. Starvation of root

B. Stoppage of photosynthesis

C. Non-movement of minerals

D. Non-movement of water.

Answer: A

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184. The loss of which will harm the tree most

A. Bark

B. Half the leaves

C. Half the branches

D. All the leaves.

Answer: A

Watch Video Solution

185. Mass flow hydpothesis was put forward by

A. Swanson

B. Munch

C. Curtis

D. De Vries.

Answer: B

Watch Video Solution

186. Oxygen containing carotenoids are

A. Carotenes

B. Xanthophylls

C. Phycobilins

D. Anthocyanins.

Answer: B

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187. In the two light reaction of photosynthesis

A. PS I produces strong oxidant while PS II a strong reductant

B. PS I produces strong reductant $NADPH$ while PS II a strong oxidant

C. PS I emits electrons for PS II

D. PS I produces ATP which is not formed

Answer: B

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188. When day light hours are increased, the rate of photosynthesis

A. Increases

B. Decreases

C. Remains unchanged

D. None of the above.

Answer: C

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189. Photosynthesis is

A. Photochemical process

B. Chemical process

C. Oxidation process

D. Reduction process.

Answer: D

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190. The scientists to discover photophosphorylation was

A. Arnon

B. Hill

C. Willstatter and Stoll

D. Park and Biggins.

Answer: A

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191. Synthesis of $ADP + Pi \rightarrow ATP$ in grana/photosynthesis is

A. Phosphorylation

B. Photophosphorylation

C. Oxidative phosphorylation

D. Photolysis.

Answer: B

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192. PS II performs

A. Reduction of CO_2

B. Photolysis of water

C. Liberation of energy

D. Formation of water.

Answer: B

Watch Video Solution

193. Kranz anatomy occurs in

A. Leaves

B. Stem

C. Flower

D. Seed.

Answer: A

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194. Photosynthate is translocated through

A. Sieve tubes/phloem cells

B. Tracheids

C. Xylem vessels

D. Latex ducts.

Answer: A

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195. Photorespiration occurs in

A. Ribosomes

B. Mitochondria

C. Peroxisomes

D. Lysosomes.

Answer: C

Watch Video Solution

196. CAM occurs in

A. Thin green leaves with reticulate venation

B. Thin green leaves with parallel venation

C. Thin coloured leaves

D. Fleshy green leaves.

Answer: D

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197. Maximum solar energy is trapped by

A. Planting trees

B. Cultivating crops

C. Growing algea in tanks

D. Growing grasses.

Answer: C

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198. A photosynthesising plant is releasing $.^{18}O$ more than the normal. The plant must have been supplied with

A. O_3

B. H_2O with $.^{18}O$

C. CO_2 with $.^{18}O$

D. $C_6H_{12}O_6$ with $.^{18}O$.

Answer: B

Watch Video Solution

199. In photosynthesis

A. ATP is formed in light reaction and glucose in dark reaction

B. Both ATP and glucose are produced in dark reaction

C. Both ATP and glucose are produced in light reaction

D. Both ATP and glucose are formed in light and dark.

Answer: A

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200. Two types of photosynthetic pigments are

A. Chlorophyll a and carotenoids

B. Chlorophyll b and carotenoids

C. Chlorophylls and carotenoids

D. Chlorophyll a and chlorophyll b.

Answer: C

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201. The main difference between chlorophyll 'a' and 'b' is

A. $-CH_3$ of chlorophyll a is replaced by $-CHO$ in clorophyll b.

B. Chlorophyll a ais linear while chlorophyll b is branched

C. Chlorophyll a has no Mg

D. All the above.

Answer: A

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202. Light energy is used in photosynthesis for

A. Breakdown of H_2O

B. Breakdown of CO_2

C. Activation of chlorophyll

D. Breakdown of $C_6H_{12}O_6$.

Answer: C

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203. Dark reaction of photosynthesis is

A. Hill reaction

B. Calvin cycle

C. Cyclic photophosphorylation

D. Non-cyclic photophosphrylation.

Answer: B

Watch Video Solution

204. If plants stop photosynthesis which gas will disappear

A. CO_2

B. N_2

C. O_2

D. NH_3

Answer: C

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205. Which plant shows chloroplast dimorphism

A. Wheat

B. Rice

C. Sugar Beet

D. Sugarcane/C_4 plant.

Answer: D

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206. Cytochromes are

A. O_2 acceptors

B. H_2 acceptors

C. Electron acceptors

D. H_2O acceptors.

Answer: C

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207. Pigment acting as a reaction centre during photosynthesis is

A. Carotene

B. Phytochrome

C. P_{700}

D. Cytochrome.

Answer: C

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208. Which one occurs both during cyclic and non-cycclic modes of photophosphorylation

A. Involvement of both PS I and PS II

B. Formation of ATP

C. Release of O_2

D. Formation of $NADPH$.

Answer: B

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209. Chlorophylls absorb visible light of wavelengths

A. 400-500 nm only

B. 300-400 nm only

C. 600-800 nm only

D. 400-500 nm and 600-700 nm.

Answer: D

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210. During dark reaction for fixation of carbon, the three carbon atoms of each molecule of 3-phosphoglyceric acid (PGA) are derived from

A. $RuBP$ only

B. CO_2 only

C. $RuBP + CO_2$

D. $RuBP + CO_2 + PEP.$

Answer: C

Watch Video Solution

211. Organelles having enzymes involved in photorespiration are

A. Mitochondria, chloroplasts and ribosomes

B. Mitochondria, peroxisomes and chloroplasts

C. Mitochondria, nucleus and ribosomes

D. Mitochondria, peroxisomes and glyoxysomes.

Answer: B

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212. C_4 cycle is connected with

A. Respiration

B. Photosynthesis

C. Transpiration

D. Growth and development.

Answer: B

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213. First product of photorespiration is

A. Phosphoglycolate

B. Glycolate

C. Glycine

D. None of the above.

Answer: A

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214. Solar energy is converted into ATP in

or

Light energy is converted into chemial energy in the presence of

A. Chloroplasts

B. Pyremoids

C. Ribosomes

D. Mesosomes

Answer: A

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215. Photorespiration is characteristic of

A. C_3 plants

B. C_4 plants

C. CAM plants

D. All the above.

Answer: A

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216. Which one is a C_4 plant

A. Maize

B. Sugarcane

C. Sorghum

D. All the above.

Answer: D

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217. Which is correct about chlorophylls a and b in leaves of higher plants

A. Both are present in equal proportion

B. Chlorophyll a is more than chlorophyll b

C. Chlorophyll a is less than chlorophyll b

D. Chlorophyll b is ten times more than chlorophyll a.

Answer: B

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218. Who demonstrated for the first time that in photosynthesis, oxygen is evolved from water

A. Ruben and kamen

B. Calvin

C. R. Hill

D. Govindji.

Answer: C

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219. Quantasomes occur on the surface of

A. Cristae

B. Plasmalemma

C. Nuclear ebvelope

D. Thylakoids.

Answer: D

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220. Liberation of oxygen when green cells in water are exposed to sunlight in presence of suitable acceptor is

A. Emerson effect

B. Blackman's reaction

C. Hill's reaction

D. Arnon reaction.

Answer: C

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221. Balance between CO_2 and O_2 is maintained by

A. Transpiration

B. Photosynthesis

C. Photorespiration

D. C_4 pathway.

Answer: D

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222. ATP synthesis during light reaction is

A. Oxidative phosphorylation

B. Photolysis

C. Photophosphorylation

D. Phosphorylation

Answer: C

Watch Video Solution

223. Calcin cycle is

A. Dpendent upon light

B. Independent of light

C. Supported by light

D. Hindered by light.

Answer: C

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224. Which one is the common product of both respiration and photosynthesis

A. ATP

B. Quinone

C. Cytochrome

D. Chlorophyll.

Answer: A

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225. Photosynthesis is a process in which

A. ATP is generated

B. $NADH$ is reduced to NAD

C. Oxidative phosphorylation occurs

D. CO_2 is reduced.

Answer: D

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226. In C_4 plants, fixation of carbon dioxide occurs in

A. Transudion tissue

B. Palisade tissue

C. Cortex of stem

D. Spongy mesophyll and bundle sheath cells.

Answer: D

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227. Who first of all indicated that water is electron donor in photosynthesis ?

A. Arnon

B. Calvin

C. Blakeslee

D. Van Niel.

Answer: D

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228. Photosystem has main light harvesting pigments

A. Chlorophyll a-660, chl a-670, chl a-680, chl a-690, chl a-700

B. Chlorophyll a-660, chl b, chl a-700, chl a-800 and carotenoid

C. Chlorophyll a-680, chl a-685, chl a-695 and xanthophyll

D. Chlorophyll a-700, chl a-800, chl-b, chl a-685 and phycobilins.

Answer: A

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229. In C_4 plants, chloroplasts are also found in

A. Spongy paranchyma

B. Epidermal cells

C. Guard cells

D. Bundle sheath cells

Answer: D

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230. Carbon dioxide assimilation occurs through

A. Krebs cycle

B. Calvin cycle

C. Glycolysis

D. Anaerobic respiration.

Answer: B

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231. Chlorophyll a has

A. $-CHO$ group

B. $-COOH$ group

C. $-CH_3$ group

D. No functional group

Answer: C

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232. C_4 cycle was discovered in

A. Groundnut

B. Sugarcane

C. Chrysanthemum

D. Apple.

Answer: B

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233. Photorespiration is favoured by

A. High oxygen and low carbon dioxide

B. High carbon dioxide and low oxygen

C. High temperature and low oxygen

D. High humidity and temperature.

Answer: A

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234. How many Calvin cycle form one hexose molecule

A. 2

B. 4

C. 6

D. 8

Answer: C

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235. Chlorophyll is soluble in

A. Water

B. Organic solvents

C. Both A and B

D. None of the above.

Answer: B

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236. Constituents of pigment system I are located on

A. Granal thylakoids

B. Stromal thylakoids

C. Outer surface of granal and stromal thylakoids

D. Stroma.

Answer: C

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237. Thylakoids possess photosynthetic units called

A. Quantasomes

B. Glyoxysomes

C. Polysomes

D. Ribosomes.

Answer: A

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238. Chlorophyll consists of

A. Porphyrin head and phytol tail

B. Phosphate head and porphyrin tail

C. Phytol head and porphyrin tail

D. Porphyrin head and phosphate tail.

Answer: A

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239. Enzymes PEP carboxylase and $RuBP$ carboxylase are located in chloroplasts of

A. C_3 plants

B. CAM plants

C. C_4 plants

D. Both B and C.

Answer: D

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240. Non-cyclic photophosphorylation is performed by

A. Dark reaction

B. PS I

C. PS II

D. Both B and C.

Answer: D

Watch Video Solution

241. Calvin cycle occurs in

A. Cytoplasm

B. Mitochondria

C. Glyoxysomes

D. Chloroplasts.

Answer: D

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242. Calvin cycle involves

A. Oxidative carboxylation

B. Reductive carboxylation

C. Phosphrylation

D. Oxidative phosphorylation.

Answer: B

Watch Video Solution

243. Plants purify air during

A. Photosynthesis

B. Respiration

C. Transpiration

D. Desiccation.

Answer: A

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244. C_4 cycle is

A. Adjunct to Calvin cycle

B. Independent cycle

C. With high $RuBP$ carboxylase efficiency

D. With PEP carboxylase in bundle sheath cells.

Answer: A

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245. Element essential for photolysis of water is

A. Nitrogen

B. Oxygen

C. Chlorine

D. Carbon.

Answer: C

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246. Supply end in solute transport is

A. Root

B. Stem

C. Green leaves and storage organs

D. Xylem and phloem.

Answer: C

Watch Video Solution

247. Photorespiration ocures in

A. Green photosynthetic parts

B. All living cells

C. Mitochondria

D. Root.

Answer: A

Watch Video Solution

248. Photorespiration is affected by

A. Temperature

B. Light intensity

C. $CO_2$and O_2

D. All the above.

Answer: D

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249. Chorophyll 'a' molecule at its carbon atom 3 of the pyrrole ring II has one of the following

A. Methyl group

B. Aldehyde group

C. Carboxyl group

D. Magnesium.

Answer: A

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250. ATP formation in chloroplast and mitochondrion is explained by

A. Chlodny-Went model

B. Chemi-osmotic theory of Mitchell

C. Munch's mass flow theory

D. Relay pump theory fo Godlewski.

Answer: B

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251. Warburg effect is decrease in the rate of photosynthesis at

A. Low carbon dioxide concentration

B. High oxygen content

C. High carbon dioxide concentration

D. Both A and B.

Answer: B

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252. C_4 Plants differ from C_3 plants with respect to

A. First product

B. Substrate which accepts carbon dioxide

C. Number of ATP molecules consumed

D. All the above.

Answer: D

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253. C_4 pathway of CO_2 fixation was discovered by

A. Blackman

B. Hatch and Slack

C. Emerson and Arnold

D. Arnon.

Answer: B

Watch Video Solution

254. Photooxidation is

A. Photorespiration

B. Photolysis

C. Light and oxygen induced break down

D. All the above.

Answer: C

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255. The core metal of chlorophyll is

Or

Which element is left when chlorophyll is burnt

A. Cu

B. Mg

C. Fe

D. Ni.

Answer: B

Watch Video Solution

256. $RuBisCO$ content of chloroplast is

A. $20\ \%$

B. $5\ \%$

C. $11\ \%$

D. $16\ \%$.

Answer: D

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257. which one of the following elements is required for photosynthesis oxygen evolution

A. F-enzyme

B. Z-enzyme

C. Co-enzyme

D. M-enzyme.

Answer: B

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258. C_4 Plants have higher net photosynthesis rate as they have

A. No photorespiration

B. PEP as CO_2 acceptor

C. Kranz anatomy

D. Photosynthesis even at low light intensity.

Answer: A

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259. Action spectrum of photosynthesis was first studied by

A. Engelmann

B. Calvin

C. Arnon

D. Hill.

Answer: A

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260. Accessory photosynthetic pigments in most green plants are

A. Engelmann

B. Calvin

C. Arnon

D. Hill.

Answer: B

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261. Primary carboxylation occurs in C_3 and C_4 plants with the help of

A. PEP craboxylase and pyruvate carboxylase

B. PEP carboxylase and $RuBP$ carboxylase

C. $RuBP$ carboxylase and PEP carboxylase

D. $RuBP$ carboxylase and pyruvate carboxylase.

Answer: C

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262. Terms apoplast and symplast were first used by

A. Munch

B. Clark

C. Fisher

D. Dixon.

Answer: A

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263. The specific function of light energy in the proess of photosynthesis is to

A. Reduction of CO_2

B. Activate other molecules

C. Split water molecules

D. None of the above.

Answer: C

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264. C_4 Plants differ from C_3 plants with respect to

A. Number of $ATPs$ consumed per hexose molecule

B. Type of end product

C. Type of pigments

D. Substrate for CO_2 in carbon assimilation.

Answer: A

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265. Main pigment involved in transfer of electrons in photosynthesis is

A. Phytochrome

B. Cytochrome

C. FAD

D. Both A and B.

Answer: B

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266. Enzyme catalase occurs in

A. Peroxisomes

B. Chloroplasts

C. Lysosomes

D. Vacuoles.

Answer: A

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267. Chloroplasts are agranal in

A. C_3 plants

B. Succulents

C. C_4 plants

D. Hydrophytes.

Answer: C

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268. The wavelength of light most absorbed during photosynthesis is

A. 700 nm

B. 660 nm

C. 550 nm

D. 440 nm.

Answer: B

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269. which one of the following elements is required for photosynthesis oxygen evolution

A. Cu

B. Fe

C. Zn

D. $Mn.$

Answer: D

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270. Pigments of PS I occur in

A. Appressed part of granal thylakoids

B. Stromal thylakoids and non-appressed parts of granal thylakoids

C. Both appressed and non-appressed parts of granal thylakoids

D. Stroma

Answer: B

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271. Which factor is not limiting in normal conditions for photosynthesis

A. Chlorophyll

B. Light

C. Water

D. CO_2

Answer: A

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272. Protochlorophyll differs from chlorophyll in lacking

A. 4 hydrogen atoms in two pyrrole rings

B. 2 hydrogen atoms in one of its pyrrole rings

C. 2 hydrogen atoms in two pyrrole rings

D. 1 hydrogen atom in one pyrrole ring.

Answer: B

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273. In photosynthesis, photolysis of water is used in

A. Reduction of $NADP^+$

B. Oxidation of $NADP$

C. Oxidation of FAD

D. None of the above.

Answer: A

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274. Number of cell organells involved in photorespiration is

A. One

B. Two

C. Three

D. Four.

Answer: C

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275. Photosynthetic synthesis of carbohydrates uses CO_2 and

A. Water in the presence of sunlight with the help of chlorophyll

B. Water in the presence of energy

C. Water with the help of chlorophyll

D. Presence of sunlight.

Answer: A

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276. Photosynthesis occurs in

A. Leaves

B. Leaf cells

C. Plants

D. Chloroplasts.

Answer: D

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277. Maximum photosynthesis occurs in

A. Blue light

B. Red light

C. Green light

D. White light

Answer: D

Watch Video Solution

278. Special feature of C_4 plams is

A. Thin cuticle

B. Multilayered epidermis

C. Kranz anatomy

D. Both A and B.

Answer: C

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279. Which of the following contains copper ?

A. Quinone

B. Plastoquinone

C. Plastocyanin

D. Cyt b_5.

Answer: C

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280. Condition favouring cyclic photophosphorylation is

A. Anaerobic environment

B. Aerobic and low light intensity

C. Aerobic and optimum light

D. Anaerobic and low light intensity.

Answer: B

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281. Wavelength of visible light/PAR is

A. 200-400 nm

B. 400-700 nm

C. 700-900 nm

D. 100-200 nm.

Answer: B

Watch Video Solution

282. The pigment present universally in all green oxygenic plants is

A. Chlorophyll a

B. Chlorophyll b

C. Chlorophyll c

D. Chlorophyll d.

Answer: A

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283. Carbon dioxide is fixed in

A. Light reaction

B. Dark reaction

C. Aerobic respiration

D. Anaerobuc respiration.

Answer: B

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284. The direction of the conduction of food through phloem is

A. From below upwards

B. From tip to bottom

C. From leaves to roots

D. Phloem never conducts food.

Answer: C

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285. In photosynthesis, oxygen is liberated during

A. Hydrolysis of carbohydrates

B. Breakdown of proteins

C. Reduction of CO_2

D. Hydrolysis of water.

Answer: D

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286. Radioactive tracer studies with $.^{14}C$ have shown that

A. Phloem transports organic nutrients

B. Phloem transports inorganic nutrients

C. Xylem transports inorganic nutrients

D. Xylem transport organic nutrients.

Answer: A

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287. Light reaction of photosynthesis is also called

A. Calvin cycle

B. Hill reaction

C. TCA cycle

D. All the above.

Answer: B

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288. Protoplasmic syreaming theory of translocation of organic solutes was first proposed by

A. Van der Honert

B. Cany and Thaine

C. De Vries

D. Curtis.

Answer: C

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289. In Maize, mesophyll cells perform photosynthetic cycle

A. C_4

B. C_3

C. C_2

D. C_1.

Answer: A

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290. Three carbons of phosphoglyceric acid formed during carbon fixation are derived from

A. $PEP + CO_2$

B. $RuBP$

C. CO_2

D. $RuBP + CO_2$.

Answer: D

Watch Video Solution

291. Ferredoxin is

A. Phenol

B. Protein

C. Fat

D. Carbohydrate.

Answer: B

Watch Video Solution

292. Green plants do not give out CO_2 during day time because they

A. Stone the same

B. Respire very slowly

C. Do not respire

D. Consume it in photosynthesis.

Answer: D

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293. Cytochrome b_6 and cytochrome 'f' occur in

A. Ribosomes

B. Mitochondria

C. Chloroplasts

D. Lysosomes.

Answer: C

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294. Match the items of column I and column II

	Column I		*Column II*
a	Mitchell	*p*	Steps of dark reaction of photosynthesis
b	Gibbs	*q*	Photophosphorylation
c	Arnon	*r*	Concept of free enrgy
d	Calvin	*s*	Chemiosmotic hypothesis
–	–	*t*	Mass flow hypothesis

A. a-s, b-t, c-r, d-q

B. a-s, b-r, c-p, d-q

C. a-r, b-s, c-p, d-q

D. a-s, b-r, c-q, d-p.

Answer: D

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295. One of the following is a C_4 plant

A. Sugarcane

B. Tomato

C. Mango

D. Apple.

Answer: A

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296. For fixing one molecule of CO_2 in Calvin cycle. Are required

A. $3ATP + 1NADPH_2$

B. $3ATP + 2NADPH_2$

C. $2ATP + 3NADPH_2$

D. $3ATP + 3NADPH_2$.

Answer: B

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297. First reaction in photosynthesis is

A. Photolysis of water

B. Excitation of chlorophyll molecules

C. Formation of ATP

D. Fixation of CO_2.

Answer: B

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298. Which of the following occurs in dark reaction of photosynthesis ?

A. Fomation of ATP

B. Release of O_2

C. Release of H_2

D. Synthesis of $PGA / PGAL$.

Answer: D

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299. Process of assimilation of CO_2 to produce carbohydrates is

A. Oxidative

B. Catabolic

C. Reductive

D. All the above.

Answer: C

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300. Starch is stored in Potato tuber as

A. Sugar is synthesised in leaves

B. Sugar is transported from leaves to tubers

C. In the tuber sugar is changed to starch

D. All the above.

Answer: D

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301. Evidence for liberation of O_2 from water during photosynthesis comes from

A. Realease of $.^{18}O$ if water contains the same

B. Isolated chloroplast supplied with reducing agent like potassium ferrocyanide evolves O_2 even in absence of CO_2

C. Photosynthetic bacteria do not liberate O_2 and they use H_2S for obtaining reducing power.

D. All the above.

Answer: D

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302. Chemical which absorbs light energy and changes it to chemical energy is

A. Xanthophyll

B. Chlorophyll a

C. Chlorophyll b

D. Chlorophyll c.

Answer: B

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303. Anatomy of C_4 plant leaf shows

A. Presence of peroxisomes

B. Presence of bundle sheath cells

C. Absence of mitochondria

D. Absence of bundle sheath cells.

Answer: B

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304. Hill used dye for his famous Hill reaction

A. Sulphur green

B. Eosine

C. Methylene blue

D. Dichlorophenol indophenol.

Answer: D

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305. Carotenes protect plants from

A. Photooxidation

B. Desiccation

C. Phtorespiration

D. Photosynthesis.

Answer: A

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306. Non-cyclic photophosphorylationdiffers from cyclic photophosphorylation in that the latter has

A. Only PS I

B. Evolution of oxygen

C. Reduction of $NADP^+$

D. Both B and C.

Answer: A

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307. Pigment system connected with oxidation of water is

A. Photosystem I

B. Photosystem II

C. Phycobilisome

D. Carotenoids.

Answer: B

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308. Assertion. Submerged plants get carbon dioxide in the form of varbonates and bicarbonates. Reason. Stomata are not present in submerged plants

A. if both are true but reason is correct explanation

B. both are true but reason is not correct explanation

C. assertion is true but reason is wrong

D. and both are wrong.

Answer: B

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309. ATP molecules required to synthesise one molecule of glucose by C_4 pathway are

A. 12

B. 18

C. 24

D. 30

Answer: D

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310. Most widely accepted theory of carbohydrate translocation is

A. Mass flow theory

B. Root pressure theory

C. Imbibition theory

D. Transpiration theory

Answer: A

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311. The hypothesis that all photosynthetic organic require a source of hydrogen was give by

A. Hill

B. Ruben and kamen

C. Van Niel

D. Emerson and Arnold.

Answer: C

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312. In C_3 plants, first carbon dioxide acceptor enzyme is

A. $PEPCO$

B. $RuBP$ carboxylase/Rubisco

C. $RuBP$ oxygenase

D. Oxidase.

Answer: B

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313. Scientist awarded Nobel Prize in 1960 for tracing the path of carbon in photosynthesis was

A. Hatch

B. Huber

C. Calvin

D. Ruben

Answer: C

Watch Video Solution

314. Blackman's law was conceived in connection with

A. Photosynthesis

B. Respiration

C. Transpiration

D. Root Pressure.

Answer: A

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315. Assertion. A plant girdled upto best shows signs of degeneration of lower portion.

Reason. Water transportation will cease

A. If both are true but reason being correct explanation

B. both true but reason is not correct explanation

C. assertion is true but reason is wrong

D. and both are wrong.

Answer: C

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316. First stable product of C_4 / HSK photosynthesis is

A. Phosphoglyceric acid

B. Ribulose 1, 5-biphosphate

C. Malic acid

D. Phosphoglyceraldehyde.

Answer: C

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317. Match the columns

	Column I		Column II
a	Girdling experiment	p	Growth
b	Cobalt chloride paper test	q	Transpiration
c	Cresograph	r	Unequal transpiration on two leaf surfaces
d	Bell jar experiment	s	Translocation in phloem

A. a-s, b-r, c-p, d-q

B. a-s, b-p, c-q, d-r

C. a-r, b-p, c-s, d-q

D. a-q, b-p, c-s, d-r.

Answer: A

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318. Which one not take part in electron transfer

A. CoQ

B. FeS

C. ATP

D. NAD^+

Answer: C

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319. In presence of high concentration of oxygen, $RuBP$ carboxylase converts $RuBP$ to

A. Malic acid and PEP

B. PGA and PEP

C. PGA and malic acid

D. PGA and phosphoglycolate.

Answer: D

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320. Photolithotrophs (photoautotrophs) obtain energy from

A. Radiations and carbon from inorganic compounds

B. Radiations and carbon from organic compounds

C. Organic compounds

D. Inorganic compounds.

Answer: A

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321. Loading of phloem is related to

A. Elongation of phloem cells

B. Separation of phloem parenchyma

C. Strengthning of phloem fibres

D. Pouring of sugar into phloem.

Answer: D

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322. Which pair is wrong

A. C_3 – Maize

B. Calvin cycle $\rightarrow PGA$

C. Hatch and Slack cycle $\rightarrow OAA$

D. C_4 — Kranz anatomy.

Answer: A

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323. Which one is product in respiration and reagent in photosynthesis?

A. O_2

B. CO_2

C. CO

D. N_2.

Answer: B

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324. PS I and PS II occur over

A. Grana of chloroplast

B. Matrix of mitochondria

C. Stroma of chloroplast

D. Inner membrane of mitrochondrion.

Answer: A

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325. A photosynthesis cell is provided with $.^{14}CO_2$ and $H_2.^{18}O$. They form

A. $C_6H_{12}O_6 + O_2$

B. $.^{14}C_6H_{12}O_6 + O_2$

C. $.^{14}C_6H_{12}O_6 + .^{18}O_2$

D. $C_6H_{12}O_6 + O_2$.

Answer: C

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326. Ground substance of chloroplast is

A. Stoma

B. Stroma

C. Granum

D. Cisterna.

Answer: B

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327. C_4 and C_3 pathways of CAM plants are separated by

A. Bundle sheath

B. Mesophyll and bundle sheath cells

C. Mesophyll and bundle sheath chloroplasts

D. Time.

Answer: D

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328. Steps in non-cyclic photophosphorylation include passage of electrons along

A. $FRS \rightarrow FD \rightarrow Cytb_6 \rightarrow Cytf \rightarrow PC \rightarrow Chla$

B. $Chla \rightarrow Cytb_6 \rightarrow Cytf \rightarrow PC \rightarrow PSI \rightarrow FRS \rightarrow FD$

C.

$$Chla \rightarrow PQ \rightarrow Cytb_6 \rightarrow Cytf \rightarrow PC \rightarrow PSI \rightarrow FRS \rightarrow FD$$

D. $PQ \rightarrow Cytb_6 \rightarrow Cytf \rightarrow PC \rightarrow PSI \rightarrow FRS \rightarrow FD.$

Answer: D

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329. $PEPco$ is associated with

A. C_3 plants

B. CAM plants

C. C_4 plants

D. Both B and C.

Answer: D

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330. PEP, the first CO_2 acceptor in C_4 cycle is

A. 3-C compound

B. 4- C compound

C. 5- C compound

D. 6-C compound.

Answer: A

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331. Law of limiting factor is

A. Law of maximum

B. Law of minimum

C. Law of optimum

D. All the above.

Answer: B

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332. The sequential order in electron transport from PS II to PS I of photosynthesis is

A. FeS, PQ, PC and Cytochrome

B. FeQ, PQ, Cytochromes and PC

C. PQ, Cytochromes, PC and FeS

D. PC, Cytochromes, FeS, PQ

Answer: C

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333. The compound formed as net gain in carbon assimilation is

A. mitochondria

B. chloroplast

C. cytoplasm

D. goly body

Answer: B

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334. Dimorphic chloroplasts occur in

A. Pea

B. Mango

C. Sugarcane

D. Cotton.

Answer: C

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335. Reaction centre of photosyngthesis is formed of

A. Chl b

B. Chl a

C. Carotene

D. Xanthophyll.

Answer: B

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336. Non-cyclic photophosphorylation involves

A. PS I only

B. PS II only

C. Stroma matrix

D. Both A and B.

Answer: D

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337. Who found that organic matter is synthesised with the help of solar energy

A. Hill

B. Van Steil

C. Mayer

D. Bayer.

Answer: C

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338. In photosynthetic electron transport system, Mn ions are associate with

A. $CF_0 - CF_1$ complex

B. Cyt $b_6 -$ Cyt f complex

C. Oxygen evolving complex

D. Plastoquinone.

Answer: C

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339. During photosynthesis

A. O_2 comes from CO_2

B. ATP is formed

C. Water is not required as reactant but only as a medium.

D.

Answer: B

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340. First transitory chemical formed by reaction between CO_2 and RuBP is

A. $PGAL/GAP$

B. PGA

C. 2-carboxy 3-keto, 1, 5-bisphosphoribotol

D. $DiHAP$.

Answer: C

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341. Red colour of tomato is due to

A. Lycopene

B. Phytochrome

C. Chromatochrome

D. Anthocyanin.

Answer: A

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342. Electrons lost by PS II are regained from

A. O_2

B. CO_2

C. H_2O

D. None of the above.

Answer: C

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343. What percentage of usable radient energy energy entering a reaction site of photosynthesis is converted to potential energy

A. $10\ \%$

B. $35\ \%$

C. $20\ \%$

D. 42 %

Answer: B

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344. Movement of materials through vascular tissues of plants is

A. Transpiration

B. Transcription

C. Transduction

D. Translocation.

Answer: D

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345. Assertion. In bacteria photosynthesis occurs by utilising wavelength longer than 700 mn.

Reason. Reaction centre is B_{890}

A. If both are true with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: B

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346. Assertion : Six molecules of $CO_2$and twelve molecules of $NADPH^+H^+$ and 18 ATP are used to from one hexose molecule.

Reason : Light reaction result in formation of ATP and $NADPH_2$

A. If both are true with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: B

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347. Chlorophyll apears green because it

A. Reflects green light

B. Transmits green light

C. Absorbs green light

D. Transforms green light.

Answer: A

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348. In photosynthesis, energy for passage of electron is the one That is absorbed by

A. Chlorophyll

B. $RuBP$

C. Water

D. ATP.

Answer: A

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349. In photosynthesis , energy from light reaction to dark reaction is transferred in the form of

A. ADP

B. ATP

C. Chlorophyll

D. $RuBP.$

Answer: B

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350. $ADP \rightarrow ATP$ reaction occurs when two protons $\left(H^{+}\right)$ are passed from

A. Thylakoid to sytosol

B. Thylakoid to lumen

C. Lumen of thylakoid to stroma

D. Stroma to thylakoid lumen.

Answer: C

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351. What is true ?

A. PEP-pyruvate causes substrate level phosphorylation

B. PS II has oxygen producing complex

C. NADPH is assimilatory power

D. All the above.

Answer: D

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352. ETC of photosynthesis process is

A. Bound to thylakoid membrane

B. Present in stroma

C. Bound to outer chloroplast membrane

D. Dispersed in sytosol.

Answer: A

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353. Maximum starch is manufactured by

A. Spongy paranchyma

B. Palisade parencyma

C. Guard cells

D. Vascular tissue.

Answer: B

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354. The process in which exces energy is lost by light waves is called

A. Fluorescence

B. Photooxidation

C. Photolysis

D. Photophosphorylation.

Answer: A

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355. Maximum photosynthesis ocu=curs in light

A. Red

B. Green

C. Very high light

D. Continuous light.

Answer: D

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356. Which one is photophosphorylation

A. $ADP + AMP \xrightarrow{\text{Light energy}} ATP$

B.

$$ADP + \quad \text{Inorganic phosphate} over st(\text{Light energy})(\ \rightarrow\ )ATP$$

C. $ADP + \quad \text{Inorganic} PO_4 \rightarrow ATP$

D. $AMP + \quad \text{Inorganic} PO_4 \xrightarrow{\text{Light energy}} ATP.$

Answer: B

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357. Stomata of CAM plants

A. Are always open

B. Open during day and close at night

C. Open during nght and close during day

D. Never open.

Answer: C

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358. In Sugarcane, $.^{14}CO_2$ is fixed in male acid. The snzyme is

A. $RuBP$ carboxylase

B. PEP carboxylase

C. Ribulose phosphate kinase

D. Fructose phosphatase.

Answer: B

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359. Which one of the following is wrong in relation to photorespiration

A. It occurs in chloroplasts

B. It occurs in day time only

C. It is characteristic of C_4 plants

D. It is characteristic of C_3 plants.

Answer: C

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360. Which ones are primarily absorbed by carotenoids ?

A. Blue and green

B. Green and red

C. Red and violet

D. Violet and blue.

Answer: A

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361. Basic feature of Kranz anatomy of C_4 plants is

A. Presence of chloroplasts in bundle sheath cells

B. Presence of chloroplasts in mesophyll and epidermal cells

C. Presence of typical granal chloroplasts in bundle sheath cells and rudimentary chloroplasts in mesophyll cells

D. Presence of rudimentary chloroplasts in bundle sheath cells and typical granal chloroplasts in mesophyll cells.

Answer: A

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362. A decrease in photosynthetic rate with increased availability of oxygen is called

A. Warburg effect

B. Richmond Lang effect

C. Blackman's Law of limiting factors

D. Emerson's enhancement effect.

Answer: A

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363. Hill reaction occurs in

A. High altitude plants

B. Total darkness

C. Absence of water

D. Presence of ferricyanide.

Answer: D

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364. Food manufactured in leaves is passed out to other parts of the plant through

A. Phototaxis

B. Translocation

C. Descent of sap

D. Chemotoxis.

Answer: B

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365. In a CAM plant the concentration of organic acid

A. Decreases during night

B. Increases during day

C. Increases during night

D. Both A and B.

Answer: C

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366. Photoautotrophs lacking chlorophyll a are

A. Cyanobacteria

B. Red algae

C. Brown algae

D. Bacteria.

Answer: D

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367. Amount of CO_2 fixed annually is about

A. 70×10^{10} kg

B. 70×10^{11} kg

C. 70×10^{13} kg

D. 70×10^{13} g.

Answer: C

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368. Plants showing C_4 photosynthesis have

A. Granal bundle sheath chloroplasts and agranal mesophyll chloroplasts

B. Agranal bundle sheath chloroplasts and granal mesophyll chloroplasts

C. Both bundle sheath and mesophyll chloroplasts are agranal

D. Both the type of chloroplasts are granal.

Answer: D

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369. Electron acceptor of PS II is

A. Cyt b

B. FRS

C. PQ

D. $NADP^+$

Answer: C

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370. C_4 plants have carboxylations

A. One

B. Two

C. Three

D. Four.

Answer: B

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371. Potted plants are not allowed to remain in room of a patient during night as

A. they concume O_2 at night

B. Produce CO_2 at night

C. They release O_2 only during day

D. they are unable to photosynthesize and deplete CO_2 of the room at night.

Answer: D

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372. Excitation of chlorophyll by light is

A. Exergonic reaction

B. Anabolic reaction

C. Photochemical reaction

D. Photooxidation reaction.

Answer: C

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373. PS-I has

A. More chlorophylla and more accessory pigments

B. More chlorophylls and less accessory pigments

C. Less chlorophylls and more accessory pigments

D. Less chlorophylls and less accessory photosynthetic pigments.

Answer: A

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374. Plants living in hot humid environment are

A. C_3 plants

B. CAM plants

C. C_4 plants

D. All the above.

Answer: D

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375. pH of phloem sap is

A. $8.7 - 9.6$

B. $7.5 - 8.6$

C. $5.0 - 6.0$

D. $2.4 - 0.8$

Answer: B

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376. The characteristics of C_4 plants is (a) Kranz anatomy (b) First product oxaloacetic acid (c) Carboxylating enzymes are $PEPco$ and Rubisco

A. a and b but not c

B. b and c and not a

C. a and c but not b

D. All a, b and c.

Answer: D

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377. Emerson effect is connected with

A. Photosynthesis

B. Respiration

C. Transpiration

D. Absorption of water.

Answer: A

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378. Photosynthesis is maximum in

A. Blue light

B. Red light

C. Green light

D. Both A and B.

Answer: D

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379. $RuBisCO$ is anzyme for

A. Regeneration of RuBP

B. Photolysis of water

C. CO_2 fixation

D. All the above.

Answer: C

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380. Noncyclic photophosphorylation produces

A. NAD^+

B. $NADH$

C. $NADPH$

D. $NADP^+$

Answer: C

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381. In electron transport system, the last electron acceptor of photophosphorylation is

A. $NADPH$

B. $NADP^+$

C. Atomic oxygen

D. Chlorophyll a.

Answer: B

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382. As compared to sun plats, plants adapted to low light intensity possess

A. High rate of CO_2 fixation

B. Larger photosynthetic unit

C. More extended root system

D. Spiny leaves.

Answer: B

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383. Which is not an electron carrier

A. CoQ

B. Cyt c

C. Cyt a

D. H_2O

Answer: D

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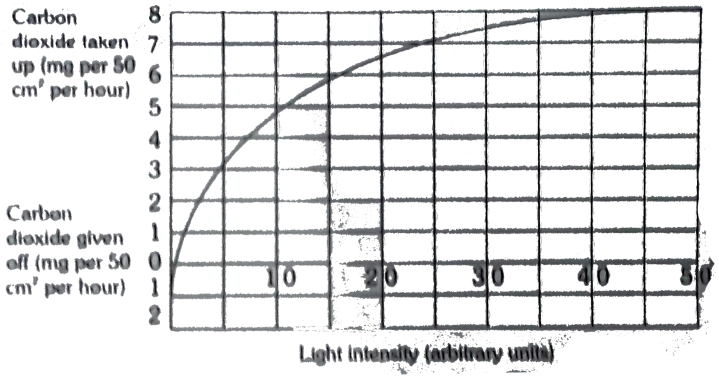
384. The graph shows the relation between light intensity and the giving off and taking up of carbon dioxide by the leaves of a plant. Why is most carbon dioxide given off when the light intensity is zero units.



A. Only respiration is occurring

B. It is only start of experiment

C. Only photosynthesis is occurring at this light intensity

D. Rate of photosynthesis equals repiration at this intensity.

Answer: A

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385. Match the columns and find the correct combination

a	Grana of chloroplast	*i*	Krebs cycle
b	Stroma of chloroplast	*ii*	Light reaction
c	Cytoplasm	*iii*	Dark reaction
d	Mitochondrial matrix	*iv*	Glycolysis

A. a-iv, b-iii, c-ii, d-i

B. a-I, b-ii, c-iv, d-iii

C. a-ii, b-iii, c-iv, d-i

D. a-iii, b-iv, c-I, d-ii.

Answer: C

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386. Assertion : Cyclis pathway of photosythesis first apperead in some eubacterial species.

Reason Oxygen started accumulating in the atmosphere after the nonj-cyclic pathway of photosynthesis evolved.

A. If both are true with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: B

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387. How many molecules of glycine are required to release one molecule of CO_2 in photorespiration

A. One

B. Two

C. Three

D. Four.

Answer: B

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388. The first step in dark reaction of photosynthesis is

A. Formation of ATP

B. Attachment of carbon dioxide to a pentose sugar

C. Excitement of an electron of chlorophyll by photon of light

D. Ionisation of water.

Answer: B

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389. Photosynthesis is essential for survival of

A. Animals

B. Plants

C. Most of the organism

D. All the above.

Answer: D

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390. Photosystem II is concerned with

A. Photolysis of water

B. Flowering

C. Reduction of CO_2

D. Release of energy.

Answer: A

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391. Which one is false about kranz anatomy

A. It is found in Atriplex

B. Bundle sheath cells have large chloroplasts and less developed grana

C. Mesophyll cells have large chloroplasts and more developed grana

D. The plants with Kranz anatomy have better photosynthetic power than C_3 plants.

Answer: C

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392. Source of CO_2 for photosynthesis during day in CAM plant is

A. 3-PGA

B. Malic acid

C. Oxaloacetic acid

D. Pyruvate.

Answer: B

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393. Water releases protons. Twelve water molecules will realease

A. $24H^+$

B. $48H^+$

C. $12H^+$

D. $6H^+$

Answer: A

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394. Phytol chain is present in

A. Carotenoids

B. Phycocyanin

C. Chlorophyll

D. Hamoglobin.

Answer: C

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395. Which one is important in electron transport system ?

A. Ubiquinone

B. Acetyl CoA

C. Tricarboxylic acid

D. Ferricyanide.

Answer: A

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396. Which of the following is the most common H^+ acceptor ?

A. FAD and NAD^+

B. FMN and NAD^+

C. FMN and FAD

D. NAD^+ and $NADP^+$

Answer: D

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397. Carbon in carbon dioxide is radioactively labelled. The product in which radioactive carbon can be traced in C_3 plants is

A. PEP

B. $RuBP$

C. $PGAL$

D. PGA.

Answer: D

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398. Blue and red light are equally effective in photosynthesis but blue light is less efficient because

A. It is fluorescent

B. It has lesser wavelength

C. A lot of energy is wasted in infrared radiations

D. It cannot bring photolysis of water and release of O_2 along.

Answer: C

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399. Which one has Kranz anatomy ?

A. Maize/sugarcane

B. Wheat

C. Rice

D. Potato.

Answer: A

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400. In which of the following substrate level phosphorylation does not occur ?

A. 1, 3-biphosphoglyceric acid $\rightarrow$ 3 phosphoglyceric acid

B. Glucose 6-phosphate $\rightarrow$ Fructose 6-phosphate

C. Succinyl CoA $\rightarrow$ Succinic acid

D. Phosphoenol pyruvic acid $\rightarrow$ pyruic acid.

Answer: B

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401. Identify the correct sequence of enzymes given below which participate in regeneration phase of Calvin cycle

1. Ribulose 5-phosphate epimerase

2. Ribulose 5-phosphate kinase

3. Transketolase

4. Triose phosphate isomerase.

A. $4, 1, 3, 2$

B. $3, 2, 4, 1$

C. $4, 3, 1, 2$

D. $2, 1, 4, 3.$

Answer: C

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402. .....are CAM plant

A. Maize

B. Pineapple

C. Onion

D. Pea.

Answer: B

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403. Number of chlorophyll arranged per reaction centre in the light harvesting complex are

A. 100

B. 200

C. 300

D. 400

Answer: C

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404. Match the columns and find the correct combination

I		II	
a	Carboxylation	*i*	Oxygen evolution
b	Phosphorylation	*ii*	Photorespiration
c	Photolysis of water	*iii*	Rubisco
d	Phosphoglycolate	*iv*	Chemosynthesis
e	*Nitrosomonas*	*v*	ATP

A. a-I, b-ii, c-iii, d-iv, e-v

B. a-iii, b-v, c-I, d-ii, e-iv

C. a-ii, b-iii, c-v, d-iv, e-i

D. a-I, b-iii, c-iv, d-ii, e-v

Answer: B

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405. Match the columns and identify the correct combination

I		II	
a	Peter Mitchell	p	Law of limiting factors
b	Blackman	q	Dark reaction
c	Daniel Arnon	r	Photosynthetic phosphorylation
d	Melvin Calvin	s	Chemiosmotic hypothesis
		t	Mass flow hypothesis

A. a-s, b-p, c-r, d-q

B. a-p, b-s, c-q, d-r

C. a-q, d-p, c-r, d-s

D. a-s, b-r, c-q, d-p.

Answer: A

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406. Choose the correct statement

A. C_4 plants do not have Rubisco

B. carboxylation of RuBP leads to the formation of PGA and phosphoglycolate

C. Carboxylation of phosphoenol pyruvaye results in the formation of C_4 acids

D. Carboxylation of C_4 acids occur in mesophyll cells

Answer: C

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407. Respiration initated in chloroplasts and occurs in light is called

A. Aerobic respiration

B. Anaerobic respiration

C. Fermentation

D. Photorespiration.

Answer: D

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408. Which one is a C_4 plant ?

A. Potato

B. Mustard

C. Onion

D. Wheat.

Answer: C

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409. As compared to a C_3 plant, how many additional molecules of ATP are needed for net production of one molecule hexose sugar by C_4 plants

A. Two

B. Six

C. Twelve

D. Zero.

Answer: C

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410. Photosynthesis in C_4 plants is relatively less limited by atmospheric CO_2 levels because

A. Effective pumping of CO_2 into bundle sheath cells

B. $RuBisCO$ in C_4 plants has higher affinity for CO_2

C. Four carbon acids and primary initial CO_2 fixation products

D. Primary fixation of CO_2 is mediated via PEP carboxylase.

Answer: D

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411. Crabohydrates, the most abundant biomlecles on earth, are produced by

A. Some bacteria, algae and green plants

B. Fungi, algae and green plants

C. All bacteria, fungi and algae

D. Viruses, fungi and bacteria.

Answer: A

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412. Solarisation is

A. Formation of chlorophyll

B. Destruction of chlorophyll

C. Utilisation of sunlight

D. Effect of solar light.

Answer: B

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413. Phenomenon which converts light energy into chemiacl energy is

A. Respiration

B. Photosynthesis

C. Transpiration

D. None of the above.

Answer: B

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414. Asserotion: C_4 photosynthetic pathway is more efficient than the C_3 pathway.

Reson : Photorespirationis suppressed in C_4 plants.

A. If both are true with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: A

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415. Assertion. The atmospheric concentration of CO_2 at which photosynthesis just compensates for resoiration is referred to as CO_2 compensation point.

Reason. CO_2-compensation point is reached when the amount of CO_2 uptake is less than that generated through respiration because the level of CO_2 is more than that required for achieving CO_2-compensation point.

A. If both are true with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: C

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416. C_4 plant shows efficiency even in

A. Low concentration of CO_2

B. Low temperature

C. High CO_2 concentration

D. At low water availability.

Answer: A

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417. Photorespiration involves oxidation of

A. Chlorophyll a

B. PGA

C. RuBP

D. Both B and C.

Answer: C

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418. ATP synthetase of chloroplasts is similar to that of

A. Mitochondria

B. Peroxisomes

C. Golgi bodies

D. Microsomes.

Answer: A

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419. Carbon assimilation occurs in bundle sheath cells of

A. CAM plants

B. C_4 plants

C. C_3 plants

D. All the above.

Answer: B

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420. How much oxygen is formed from 264 g of CO_2 and 216 g of H_2O ?

A. 96 g

B. 216 g

C. 264 g

D. 192 g.

Answer: D

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421. Photosynthesis is

A. Endothermic process

B. Catabolic process

C. Exothermic process

D. Thermodynamic process.

Answer: A

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422. Equal amount of sunlight is received on all sides by

A. Unipinnate leaf

B. Palmately compound leaf

C. Isobilateral leaf

D. Dorsiventral leaf.

Answer: C

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423. Energy contained in plant carbohydrates comes from

A. Minerals

B. CO_2

C. Proteins

D. Sunligth.

Answer: D

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424. In photosystem-I the first electron acceptor is

A. An Fe-S protein

B. Ferredoxin

C. Cytochrome

D. Plastocyanin.

Answer: A

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425. During photorespiration, the oxygen consuming reaction (s) occur in

A. Stroma of chloroplasts

B. Stroma of chloroplasts and mitochondria

C. Stroma of chloroplasts and peroxisomes

D. Grana of chloroplasts and peroxisomes.

Answer: C

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426. Which is most abundant in chloroplast ?

A. Aldolase

B. RuBP carboxylase

C. Phosphatase

D. Transketolase.

Answer: B

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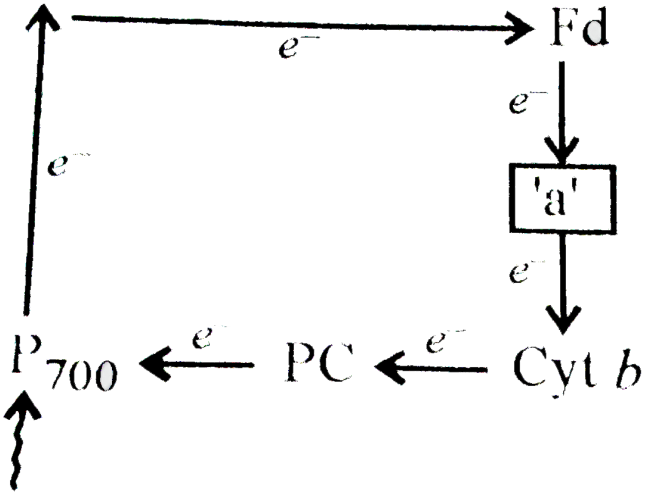
427. In the chart of photophosphorylation, what does 'a' represent



A. Cyt a

B. Cyt a_3

C. FRS

D. PQ.

Answer: D

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428. NAD^+ is reduced in photorespiration inside

A. Mitochondria

B. Mitochondria and peroxisome

C. Mitochondria and chloroplasts

D. Chloroplasts and peroxisomes.

Answer: A

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429. Chloroplasts without grana are known to occur in

A. Bundle sheath cells of C_3 plants

B. Bundle sheath cells of C_4 plants

C. Mesophyll cells of all plants

D. Mesophyll cells of C_4 plants.

Answer: B

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430. Assertion. Under conditions of high intensity and limited CO_2 supply, photorespiration has a useful role in proteching the plants from photo-oxidative damage.

Reason. If enough CO_2 is not available to utilise light energy for carboxylation to proceed, the excess energy may not cause damage to plants

A. If both are true with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: A

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431. Assertion. Photosynthetically C_4 plants are less efficient than C_3 plants.

Reason. The operation of C_4 pathway requires the involvement of only bundle sheath cells

A. If both are true with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: D

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432. Which of the following statements is true with regard to light reaction of photosynthetic mechanism in plants

A. Chlorophyll a occurs with peak absorption at 680 nm in PS I and 700 nm in PS II

B. Mg and Na are associated with photolysis of H_2O

C. O_2 is evolved during cyclic photophosphorylation

D. PS I and PS II are both involved in noncyclic photophosphorylation

Answer: D

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433. Find out correct simplified equation of photosynthesis

A. $CO_2 + 2H_2O \xrightarrow[\text{chlorophyll}]{\text{light energy}} C_5H_{10}O_4 + H_2O + O_2 \uparrow$

B. $CO_2 + 2H_2O \xrightarrow[\text{chlorophyll}]{\text{light energy}} (CH_2O)_n + H_2O + O_2 \uparrow$

C. $CO_2 + 2H_2O \xrightarrow[\text{chlorophyll}]{\text{light energy}} (CH_2O)_n + O_2 \uparrow$

D. $CO_2 + 2H_2O \xrightarrow[\text{chlorophyll}]{\text{light energy}} C_3H_6O_3 + CO_2 + O_2 \uparrow$

Answer: B

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434. The Calvin cycle proceeds in three stages

(1) Reduction, during which carbohydrate is formed at the expense of the photochemically made ATP and NADPH

(2) Regeneration, during which the carbon dioxide acceptor ribulose-1,5-biphosphate is formed

(3) Carboxylation during which carbon dioxide combines with ribulose-1,5-biphoshate is formed

A. $3, 1, 2$

B. $3, 2, 1$

C. $1, 2, 3$

D. $2, 1, 3$

Answer: A

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435. Which one does not evolve oxygen

A. Green algae

B. Blue-green algae

C. Autotrophic plants

D. Photosynthetic bacteria.

Answer: D

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436. The first reaction in photorespiration is

A. Carboxylation

B. Decarboxylation

C. Oxygenation

D. Phosphorylation.

Answer: C

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437. Girdling experiment is not successful in monocots due of

A. Vansular bundles are not arranged in a ring

B. Vascular bundles are arranged in a ring

C. Vascular bundles are radial

D. None of above.

Answer: A

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438. Which one provides electrons for reduction reactions in photosynthesis

A. $NADPH$

B. chlorophyll

C. Cytochrome

D. Water.

Answer: D

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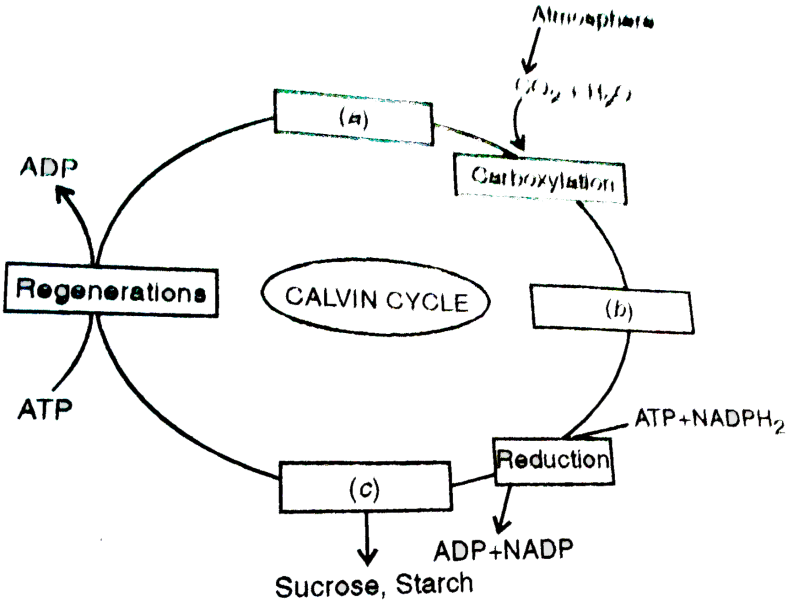
439. Choose the correct combinations of labelling in Calvin cycle



A. a-RuBP, b-Triose phosphate, c-PGA

B. a-PGA, b-RuBP, c-Triose phosphate

C. a-PGA, b-Triose phosphate, c-RuBP

D. a-RuBP, b-PGA, c-Triose phosphate

Answer: D

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440. Match the columns and choose the correct option

	Column I		Column II
a	Visible light	i	0·1 – 10 nm
b	Ultraviolet	ii	400 – 700 nm
c	X-rays	iii	Longer than 700 nm
d	Infrared	iv	100 – 400 nm
		v	0·1 u

A. a-I, b-iii, c-iv, d-v

B. a-iii, b-ii, c-I, d-v

C. a-iv, b-iii, c-ii, d-i

D. a-ii, b-iv, c-I, d-ii.

Answer: D

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441. Photolysis of a water molecule yields

A. 2 electrons and 4 protons

B. 4 electrons and 4 protons

C. 4 electrons and 2 protons

D. 2 electrons and 2 protons

Answer: D

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442. Four electrons produced during photolysis of water will enter

A. PS I

B. PQ

C. PS II

D. PC.

Answer: C

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443. In photorespiration, peroxisome helps in

A. Synthesis of PGA

B. Reduction of glyoxylate

C. Oxidation of glycolate

D. Oxygenation of glycolate.

Answer: C

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444. What is true about compensation point in C_3 and C_4 plants

A. Compensation point of C_3 plants is higher

B. Compensation point of C_4 plants is higher

C. It is equal

D. None of these as it is variable.

Answer: A

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445. CAM plants belong to family

A. Malvaceae

B. Crassulaceae

C. Trapaceae

D. Oechidaceae.

Answer: B

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446. Munch hypothesis is based on translocation of food due to

A. Imbibition force

B. Turgor pressure (TP) gradient

C. Both A and B

D. None of these.

Answer: B

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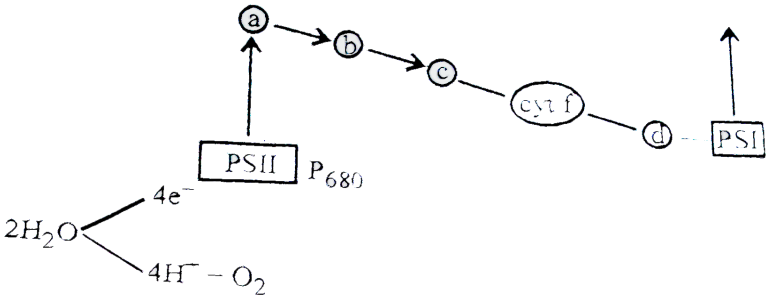
447. In the above schematic diagram which is plastocyanin



A. a

B. b

C. c

D. d

Answer: D

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448. In non-cyclic photophosphorylation, PS I is reduced by

A. Electron from PS II

B. Electron from ferredoxin

C. Hydrogen from water

D. Hydrogen from PS II.

Answer: A

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449. Succulents perform CO_2 fixation

A. CAM pathway

B. C_4 pathway

C. C_3 pathway

D. C_2 pathway.

Answer: A

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450. Coupling factor F occurs over

A. Ribosome

B. stroma

C. Matrix

D. Thylakoids.

Answer: D

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451. In photosynthesis splitting of water occurs during

A. Cyclic photophosphorylation

B. Non-cyclic photophosphorylation

C. Oxidative photophosphorylation

D. Calvin cycle.

Answer: B

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452. Dcmu

A. PS II

B. PS I

C. Destroys chloroplast

D. Inhibits oxidative phosphorylation.

Answer: A

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453. Ammonia is produced during

A. Photorespiration

B. CAM

C. Dark respiration

D. All the above.

Answer: A

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454. 3-PGA is first stable product in

A. Carbon oxidation cycle

B. Carbon reduction cycle

C. Reductive amination

D. Malic acid synthesis.

Answer: B

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455. In the leaves of C_4 plants, malic acid formation during CO_2 fixation occurs in the cells of

A. Epidermis

B. Bundle sheath

C. Phloem

D. Mesophyll.

Answer: D

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456. Which is not an accessory pigment

A. Carotene

B. Xanthophyll

C. Chlorophyll a

D. Chlorophyll b.

Answer: C

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457. Which chlorophyll does not possess phytol

A. Chl a

B. Chl b

C. Chl c

D. Chl d.

Answer: C

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458. Photorespiration is not detectable in

A. C_3 plants

B. C_4 plants

C. Both A and B

D. None of the above.

Answer: B

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459. $RuBP$ occurs in

A. Krebs cycle

B. C_4 plants

C. ETS

D. Calvin cycle.

Answer: D

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460. Maximum CO_2 fixation occurs in

A. Phytoplankton

B. Bacteria

C. Green plants

D. Zooplankton.

Answer: A

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461. Molecules of $RuBP$ required to produce 20 molecules of serine in photorepiration are

A. 60

B. 40

C. 20

D. 80

Answer: B

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462. Which is correct in photorespiration ?

A. In mitochondria serine is converted into hydroxypyruvate

B. In mitchondria two glycine molecules unite to form serine

C. In mitochondria, glycolate is oxidised to form glyoxylate

D. In peroxisomes, three molecules of glycine unite to form serine.

Answer: B

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463. Identify the correct combinations

	Substrate	Enzyme	Product
I	Phosphoenol pyruvate	PEP carboxylase	C_4 acid
II	Malate	Malic enzyme	C_4 acid
III	RuBP	Ribulose phosphate kinase	C_3 acid
IV	Pyruvate	Pyruvate dikinase	C_3 acid

A. III and IV

B. I and IV

C. II and III

D. I and II.

Answer: B

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464. What is correct about the following satement

(a) Portion of spectrum between 500-800 nm is PAR

(b) Mg, Ca, Cl have prominent role in photolysis of water

In cyclic photophosphorylation, O_2 and $NADPH$ are not produced

A. a true, b, c false

B. b true, a, c false

C. a, b true, c false

D. a, b false, c true

Answer: D

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465. What are true

(a) In C_4 plants, primary CO_2 acceptor is PEP

(b) PS II absorbs energy at or just below 680 mm

(c) PS I has P_{683}

A. a, c

B. a

C. a, b

D. c

Answer: C

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466. Which ones are correct

(a) Photosynthetic ATP synthesis is called photophosphorylation

Kranz anatomy occurs in leaf

(c) Reduction in $NADP$ to $NADPH$ occurs during Calvin cycle

(d) Magnesium occurs in phytol tail of chlorophyll

A. a, b correct

B. c, d correct

C. a, c correct

D. a, d correct

Answer: A

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467. Match the columns

	I		II
a	Warburg effect	*p*	Change in gene frequency by chance
b	Pasteur effect	*q*	Postponing severence of leaves by cytokinin
c	Emerson effect	*r*	Decline in consumption of respiratory substrate during transition from anaerobic to aerobic conditions
d	Wright effect	*s*	Inhibitory effect of O_2 on photosynthesis
		t	Enhancement of photosynthesis by two different wavelengths of light

A. a-t, b-r, c-p, d-s

B. a-s, b-t, c-q, d-r

C. a-s, b-r, c-t, d-p

D. a-t, b-s, c-p, d-q.

Answer: C

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468. In CAM plants, CO_2 required for photosynthesis enters the plant during

A. Dattime when stomata are open

B. Night when stomata are open

C. Night when hydathodes are open

D. Daytime through lenticels.

Answer: B

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469. Cyclic phosphorylation cannot sustain photosynthesis

A. PS I does not function beyond 680 nm

B. No evolution of oxygen

C. Unidirectional cyclic movement of electrons

D. Only ATP is formed, $NADPH$ is not formed.

Answer: D

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470. Which one is feature of Kranz anatomy

A. Well developed chloroplasts in bundle sheath cells

B. Rudimentary chloroplasts in bundle sheath cells

C. Chloroplasts in epidermal cells

D. Chloroplasts in vascular tissue.

Answer: A

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471. CAM plants do not show photorespiration due to

A. Keeping stomata closed during day time

B. Using PEP carboxylase

C. Fixing CO_2 into organic acid in night and releasing CO_2 during day

D. Performing Calvin cycle at night

Answer: C

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472. From which of the following, photosynthetic autotrophs receive their energy?

A. Inorganic chemicals

B. Organic chemicals

C. Heat

D. Light.

Answer: D

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473. Which is essential component of chlorophyll

A. Mn

B. Cu

C. Mg

D. Fe.

Answer: C

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474. HSK pathway is also known as

A. C_3 cycle

B. C_4 cycle

C. C_2 cycle

D. None of the above.

Answer: B

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475. About $71\ \%$ of total global carbon is found is

A. Oceans

B. Forests

C. Agro ecosystem

D. Grasslands.

Answer: A

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476. The C_4 plants are photosynthesis more efficient then C_3 plant because

A. CO_2 efflux is not prevented

B. They have more chloroplasts

C. CO_2 compensation point is more

D. CO_2 generated during photorespiration is recycled through PEP carboxylase.

Answer: B

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477. The first acceptor of electrons from an excited chlorophyll molecule of phtosystem II is

A. Quinone

B. Ferredoxin

C. Cytochrome b

D. Cytochrome f.

Answer: A

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478. Final electron acceptor of PS II is

A. Phaeophytin

B. Plastoquinone

C. Cyt b

D. Plastocyanin.

Answer: D

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479. Photolysis of water requires

A. Light

B. Chlorophyll

C. Both A and B

D. Electron transport.

Answer: C

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480. PGA is reduced through

A. $NADPH_2$

B. $FADH_2$

C. CoA

D. CoQ.

Answer: A

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481. PS I is inactive at

A. 550 nm

B. 680 nm

C. 690 nm

D. 780 nm.

Answer: D

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482. Enzyme responsible for formation of glucose from glucose 6-phosphate is

A. Dehydrogenase

B. Aldolase

C. Kinase

D. Phosphatase.

Answer: C

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483. In C_4 plants, the bundle sheath cells

A. Have thin walls to facilitate gaseous exchange

B. Have large intercellular spaces

C. Have a high density of chloroplasts

D. Are rich in PEP carboxylase.

Answer: C

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484. Identify the incorrect statement with respect to Calvin cycle

A. $NADPH + H^+$ produced in light reaction is used to reduce diphosphoglycerate

B. First stable intermediate compound is phosphoglycerate

C. Carboxylation of $RuBP$ is catalysed by Rubisco

D. 18 molecules of ATP are synthesised during carbon fixation.

Answer: D

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485. Which statement about photosynthesis is false

A. Enzymes required for carbon fixation are locted in grana of chloroplasts

B. In green plants, both PS I and PS II are required for synthesis of $NADPH + H^+$

C. Electron carriers of photophosphorylation are located on thylakoid membranes.

D. Photosynthesis is redox process in which water is oxidised and CO_2 is reduced.

Answer: A

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486. Vein loading of sucrose into companion cell is

A. Diffusion

B. Active process

C. Passive transport

D. Turgor.

Answer: B

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487. Non-cyclic electron flow in chloroplast/light reaction results in production of

A. ATP

B. ATP and $NADPH$

C. $ATP, NADPH, O_2$

D. $NADPH.$

Answer: C

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488. phloem sap is mainly made of

A. Sucrose

B. Galactose

C. Fructose

D. Starch.

Answer: A

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489. In chorophyll, structure four pyrrole ring are united with Mg by their atoms of

A. C

B. H

C. O

D. N.

Answer: D

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490. An alternate CO_2 fixation mechanism was of ound some tropical species of grass family by Hatch and Slack, who were from

A. England

B. Australia

C. America

D. New zealand.

Answer: B

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491. Fixation and reduction of CO_2 require

A. ATP

B. $NADPH$, chlorophyll, water

C. ATP, $NADPH$

D. ATP, $NADPH$ and light.

Answer: C

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492. The enzymes ribulose biphosphate carboxylase-oxygenase and phosphoenol pyruvate carboxylase are activated by

A. Zn

B. Mo

C. Mn

D. Mg.

Answer: D

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493. Which is false ?

A. Flow of electrons from water to $NADP^+$ is non-cyclic and produces ATP

B. Light energy for photolysis of water comes from reaction centre of PS II

C. Two photosystems are needed for reduction of $NADP^+$

D. P_{680} and P_{700} are reaction centres of PS I and PS II respectively

Answer: D

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494. Mineral involved in photolysis of water are

(a) Mn (b) Ca

(c) Mg (d) $Cl.$

A. a, b

B. a, b, d

C. c, d

D. a, b, c

Answer: B

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495. Enzyme responsible for primary carboxylation in C_4 plants is

A. PEP carboxylase

B. Succinic dehydrogenase

C. RuBP carboxylase oxygenase

D. Hexokinase

Answer: A

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496. Ratio between 2-carbon and 3-carbon intermediate having NH_2 group formed in photosynthetic oxidation cycle is

A. $2:1$

B. $1:1$

C. $3:2$

D. $3:4$

Answer: A

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497. Chloroplast stroma of higher plants contains

A. Chlorophyll

B. Light dependent reaction enzymes

C. Light independent reaction enzymes

D. Lysosomes.

Answer: C

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498. Reaction centre of PS I is ___ and reaction centre of PS II is___

A. P_{700}

B. P_{680}

C. Chl_{715}

D. Chl_{685}.

Answer: A

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499. Isotope of oxygen used in studying photolysis is

A. $._{}^{16}O$

B. $._{}^{15}O$

C. $._{}^{17}O$

D. $._{}^{18}O$

Answer: D

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500. PS II accepts electroms from

A. OH^-

B. O^{2-}

C. H^+

D. Both A and C.

Answer: A

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501. PGA as the first CO_2 fixation product was discovered in photosynthesis of

A. Gymnosperms

B. Angiosperms

C. Alga

D. Bryophyte.

Answer: C

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502. Which is wrongly matched

A. Sorghum - Kranz anatomy

B. PS II -700

C. Photorespiration $-C_3$

D. PEP carboxylase - Mesophyll cells

Answer: B

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503. Mineral involved in photolysis of water are

(a) Mn (b) Ca

(c) Mg (d) Cl.

A. Mg and Cl

B. K and Mn

C. Mo and Mn

D. Mn and Cl

Answer: D

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504. Which of the following statement regarding C_4 plants is false

A. The primary CO_2 acceptor is a 5-carbon molecule

B. The initial carboxylation reaction occurs in mesophyll

C. Calvin pathway does not take place in the mesophyll cells but does so only in bundle sheath cells

D. Leaves that fix CO_2 have two cell types

Answer: A

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505. In which type reactions related to plant photosynthesis, peroxisomes are involved

A. Glycolytic cycle

B. Calvin cycle

C. Bacterialphotosynthesis

D. Glyoxylate cycle.

Answer: A

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506. One molecule of glucose in Calcin cycle is formed from

A. $6CO_2 + 12ATP$

B. $6CO_2 + 18ATP + 12NADP$

C. $6CO_2 + 18ATP + 30NADPH$

D. $6CO_2 + 30ATP + 12NADPH$

Answer: B

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507. The creation of proton geadient across the thyakoid membrane is a result of

A. Decrease in proton number in stroma

B. Decrease in pH in the lumen

C. Accumulation of protons in the lumen

D. All the above.

Answer: D

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508. Loss of water in C_4 plants as compared to C_3 plants for the same amount of CO_2 fixed is

A. Double

B. One third

C. One fourth

D. Half

Answer: B

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509. Plants are removed from patient's room during night because

A. They consume O_2 at night

B. They release CO_2 at night

C. They produce CO_2 all the time but release O_2 only during day

D. They do not photosynthesise at night so that they increase CO_2 concentration at night.

Answer: D

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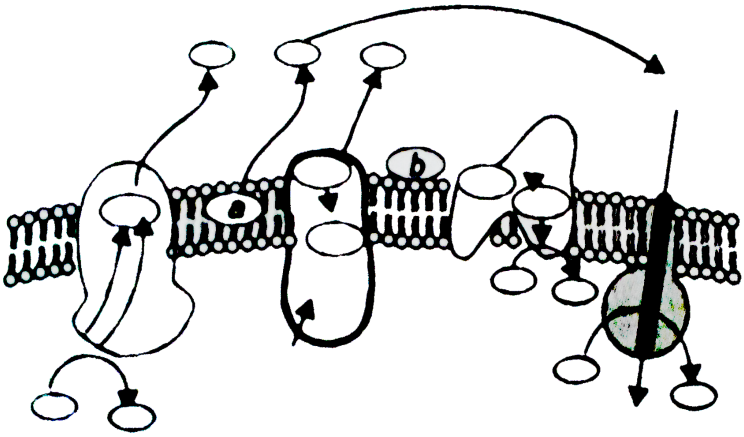
510. Observe the diagram. Identify a and b



A. a-CoQ, b-Cyt c

B. a-Cyt c, b-CoQ

C. a-Fes protein, b-FMN

D. a-FMN, b-FeS protein.

Answer: A

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511. In C_4) pathway, CO_2 fixation in mesophyll cells is carried out by the enzyme

A. PEP carboxylase

B. Pyruvate dehydrogenase

C. Rubisco

D. Pyruvate decarboxylase.

Answer: A

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512. Which one of the following statements aboun the events of non-cyclic photophosphorylation is not correct

A. Photolysis of water takes place

B. Only one photosystem participates

C. ATP and NADPH are produced

D. O_2 is released.

Answer: B

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513. Plants convert light into chemical energy with a photosynthetic efficiency of

A. 35-41 %

B. 20-35 %

C. 6-20 %

D. 3-6 %.

Answer: D

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514. Which one of the following does not play any role in photosynthesis

A. Phycocyanin

B. Phycoerythrin

C. Anthocyanin

D. Xanthrophyll.

Answer: C

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515. How many PGAL molecules would regenerate 15 RuBP

A. 30

B. 25

C. 15

D. 20

Answer: A

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516. Which is correct for C_4 photosynthesis

A. Light phase occurs in bundle sheath cells

B. CO_2 fixation occurs in mesophyll cells

C. Light phase occurs in mesophyll cells

D. Photorespiration occurs in mesophyll cells.

Answer: C

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517. Photorespiration is called

A. C_2 cycle

B. C_3 cycle

C. C_4 cycle

D. C_5 cycle.

Answer: A

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518. In C_3 plants, photosynthesis occur in

A. Bundle sheath cells

B. Peroxisomes

C. Mesophyll cells

D. Kranz anatomy.

Answer: C

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519. H_2 donor during photosynthesis is

A. $NADH$

B. ATP

C. $NADP$

D. $NADPH.$

Answer: D

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520. Rate of phosynthesis is higher in

A. Very high light

B. Red light

C. Green light

D. Continuous light.

Answer: B

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521. Which pigment of the plant takes part in light reaction of potosynthesis

or

Which pigment is present universally in all green plants

A. Xanthophyll

B. Chl a

C. Carotene

D. Phycoxanthin.

Answer: B

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522. Raw meterials required for light reactions are

A. ADP and H_2O

B. ADP, H_2O and $NADP$

C. ADP and $NADPH_2$

D. ATP and $NADP$.

Answer: B

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523. Which does not show HSK pathway

A. Maize

B. Jowar

C. Sugarcane

D. Sunflower.

Answer: D

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524. Read the following four statement A,B,C and D and select the right opition having both correct statements.

statements

(a) Z scheme of light raction takes place in presence of PS I only .

(B) Omly PS I is functional in cyclic photosporylation

(c) Cyclic photophosphorylation results into synthesis of ATP and $NADPH_2$

(D) Stroma lamllae lack PSII as welll as NADP

A. b and d

B. a and b

C. b and c

D. c and d

Answer: A

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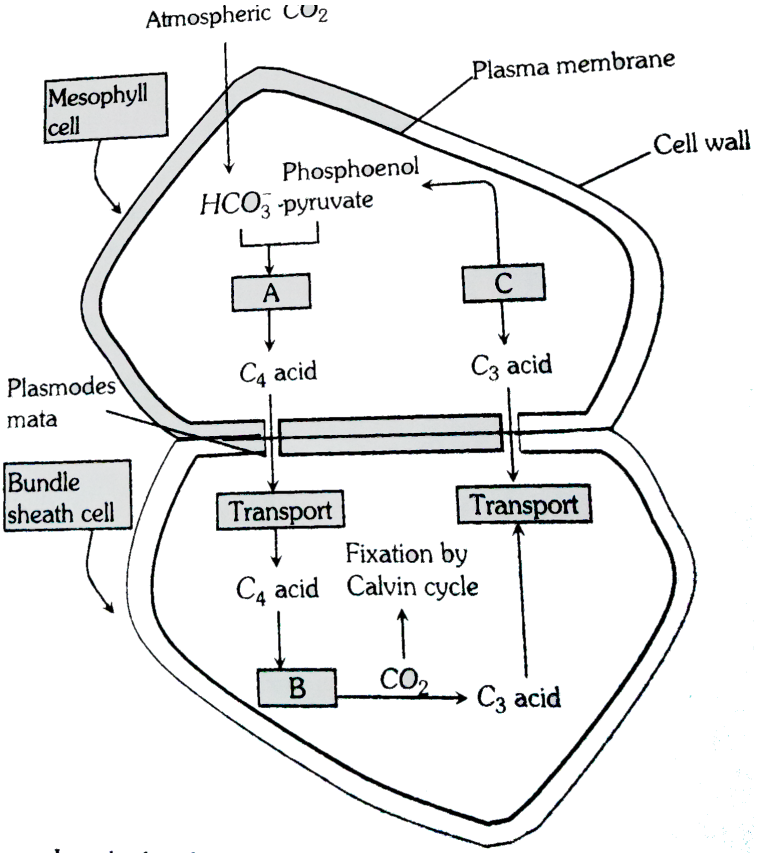

525.

In which of the following option correct words for all the three blanks A, B and C are indicated

	A	B	C
(a)	Decarboxylation	Reduction	Regeneration
(b)	Fixation	Transamination	Regeneration
(c)	Fixation	Decarboxylation	Regeneration
(d)	Carboxylation	Decarboxylation	Reduction

A. a Decarboxylation b Reduction c Regeneration

B. a Fixation b Transamination c Regeneration

C. a Fixation b Decarboxylation c Regeneration

D. a Carboxylation b Decarboxylation c Reduction

Answer: C

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526. Quantosome is unit related to

A. Respiration

B. Ascent of sap

C. Growth

D. Photosynthesis.

Answer: D

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527. In C_4 pathway, $RuBP$ accepts CO_2 inside

A. Xylem parenchyma

B. Phloem parencyma

C. Mesophyll cells

D. Bundle sheath cells

Answer: D

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528. In C_4 pathway, $RuBP$ receives CO_2 from

A. Pyruvic acid

B. PEP A

C. OAA

D. Malic acid.

Answer: D

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529. Product of photorespiration is

A. Phosphoglycerate

B. Erythrose 4-phosphate

C. Dihydroxy acetone 3-phosphate

D. All the above.

Answer: A

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530. Chlorophyll appears green due to

A. Absorption of green light

B. Red fluorescence

C. Green fluorescence

D. Absorption of red and blue light.

Answer: D

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531. Last electron acceptor of PS I is

A. Ferredoxin

B. Cyt b_6

C. Plastocyanin

D. Plastoquinone.

Answer: A

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532. Free radical has electron

A. Unpaired and extremely reactive

B. Paired and extremely inactive

C. Unpaired and extremely inactive

D. Paired and extremely reactive.

Answer: A

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533. In which cells of leaf, pyruvate is coverted to PEP in C_4 pathway

A. Epidermal cells

B. Mesophyll cells

C. Bundle sheath cells

D. Guard cells.

Answer: B

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534. In three Calvin cycles, gross number of PGAL molecules produced at the cost of ATP and $NADPH_2$

A. $3PGAL, 3ATP, 3NADPH_2$

B. $6PGAL, 6ATP, 6NADPH_2$

C. $18PGAL$, $18ATP$, $18NADPH_2$

D. $9PGA$, $9ATP$, $9NADPH_2$.

Answer: B

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535. Which is not related to photorespiration

A. Peroxisomes

B. Lysosomes

C. Mitochondria

D. Chloroplasts.

Answer: B

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536. Sunken stomata are usually found in

A. Phanerogams

B. C_3 plants

C. CAM plants

D. Insectivorous plants.

Answer: C

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537. Plants requiring low light intensity for optimum photosynthesis is called:

A. Bryophytes

B. Pteridophytes

C. Heliophytes

D. Sciophytes.

Answer: D

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538. A reduction in O_2 evolution occurs when light wavelength is

A. More than 680 nm

B. Less than 680 nm

C. Less then 660 nm

D. 560 nm.

Answer: A

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539. In the absence of $NADP^+$, electrons of photosynthetic electron transport system pass to

A. Cyt. F

B. Cyt. b_6

C. Plastocyanin

D. Quinine.

Answer: B

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540. RuBisCo occurs in high quantity as it is

A. An oxygenase

B. Catalysing reversible reaction

C. Degraded rapidly

D. Very slow acting enzyme.

Answer: D

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541. Light reaction in stroma lamellae of chloroplast results in the production of

A. ATP

B. $NADPH_2$

C. $ATP + NADPH_2$

D. O_2.

Answer: A

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542. Electron energy is used to drive protons against concentration gradient across thylakoid membrane into

A. Stroma lamella

B. Thylakoid lumen

C. Stroma

D. Interthylakoid space.

Answer: B

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543. Formation of phosphoglyceraldehyde from phosphoglyceric acid is

A. Hydrolysis

B. Oxidation

C. Reduction

D. Electrolysis.

Answer: C

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544. Rate of photosynthesis is maximum in

A. Orange light

B. Yellow light

C. Blue light

D. Green light.

Answer: C

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545. Optimum temperature for photosynthesis is

A. $35^\circ - 40^\circ C$

B. $25^\circ - 35^\circ C$

C. $20^\circ - 25^\circ C$

D. $10^\circ - 15^\circ C.$

Answer: C

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546. Select the incorrect match for C_4 cycle

A. Primary CO_2 fixation product $- PGA$

B. Site for initial carboxylation - mesophyll cells

C. Primary CO_2 acceptor $-PEP$

D. C_4 plant- Maize.

Answer: A

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547. Which is related to light reaction of photosynthesis

A. In PS II light reaction centre is P_{700}

B. In PS I light reaction centre is P_{680}

C. Photolysis is associated with PS I

D. PS I and PS II are associated in Z-scheme

Answer: D

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548. Presence of bundle sheath is characteristic of

A. C_4 plants

B. Xerophytic plants

C. Grass family

D. C_3 plants.

Answer: A

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549. In C_4 plants, bundle sheath cells have

A. Thin wall for gaseous exchange

B. Rich PEP carboxylase

C. High density of chroplasts

D. Large intercellular spaces.

Answer: C

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550. Of the total incident solar radiation the proportion of PAR is:

A. Less than 50 %

B. More than 80 %

C. About 70 %

D. About 60 %.

Answer: A

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551. CAM helps the plants in

A. Disease resistance

B. Reproduction

C. Conserving water

D. Secondary growth.

Answer: C

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552. In kranz anatomy, the bundle sheath cells have

A. Thick walls, many intercellular spaces and no chloroplasts

B. Thin walls, no intercellular spaces and large number of chloroplasts

C. Thick walls, no intercellular spaces and few chloroplasts

D. Thin walls, many intercellular spaces and several chloroplasts.

Answer: B

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553. Which is correct

A. C_4 plants are more efficient than C_3 plants

B. C_3 plants are more efficient than C_4 plants

C. Photorespiration is useful process

D. Photorespiration is about in C_3 plants.

Answer: A

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554. Assertion. Protons produced by photolysis accumulate in lumen of thylakoids

Reason. Photolysis occurs in inner membrane of thylakoids

A. If both the with reason being correct explanation

B. both are true with reason being not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: A

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555. Photo-oxidation of water results in the formation of

A. H^+, O_2, ATP

B. H^+, O_2, e^-, ATP

C. H^+, O_2, e^-

D. None of the above.

Answer: C

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556. Melvin Calvin was professor of

A. Botany

B. Plant physiology

C. Biochemistry

D. Chemistry.

Answer: D

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557. In overall process of photosynthesis, the number of CO_2 water, sugar and O_2 molecules utilised and produced is

A. 12

B. 13

C. 19

D. 31

Answer: C

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558. During Calvin cycle the total number of CO_2 ATP and NADPH molecules utilised and glucose, ADP and NADP molecules generated is

A. 31

B. 36

C. 61

D. 67

Answer: D

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559. The chemical composition of chlorophyll and carotenoids was given by

A. Senebier

B. Mayer and Anderson

C. Rober Mayer

D. Willstatter and stoll.

Answer: D

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560. Which is wrongly matched

A. Joseph Priestley - Showed that plants release O_2

B. Jan Ingenhousz - Showed that sunlight is essential for photosynthesis

C. Sachs - Plants produce glucose /starch

D. Engelmann - Green substance is located within special bodies in plants

Answer: D

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561. Which is false about C_4 pathway

A. The primary about C_4 pathway

B. Bundle sheath cells contain PEP case

C. Enzyme for CO_2 fixation is PEP case

D. Mesophyll cells lack RuBisCO

Answer: B

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562. Which statement about photosynthesis are correct

(a) First CO_2 acceptor in C_4 cycle is PGA

(b) In C_3 plants, first stable product of photosynthesis is RuBP

(c) Cyclic photophosphorylation results in formation of ATP

(d) Oxygen liberated during photosynthesis comes from water

A. a and b alone are correct

B. a and c alone are correct

C. c and d alone are correct

D. b and c alone are correct

Answer: C

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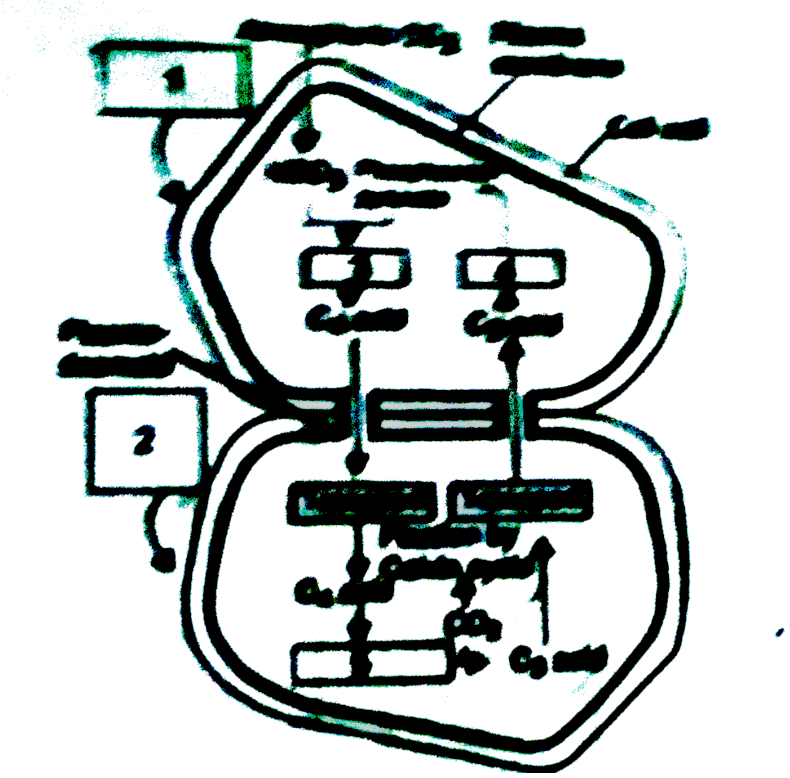
563. Choose the correct combination of labelling 1-5



A. 1. Mesophyll cell. 2 Bundle sheath cell. 3. Regeneration. 4 Fixation. 5. Decarboxylation

B. 1. Bundle sheath cell 2. Mesophyll cell. 3. Fixation 4. Regeneration 5. Decarboxylation

C. 1. Mesophyll cell 2. Bundle sheath cell 3. Decarboxylation 4. Fixation 5. Regeneration

D. 1. Mesophyll cell 2. Bundle sheath cell 3. Fixation 4. Regeneration 5. Decarboxylation

Answer: D

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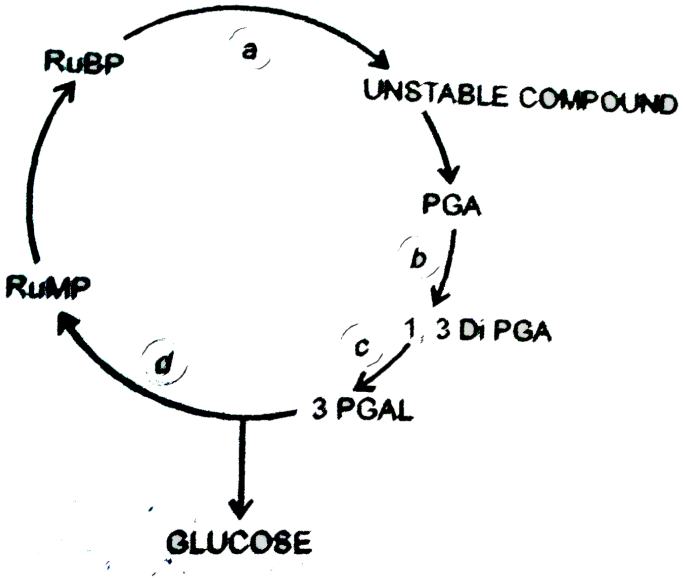
564. Select the option where alphabets are correctly identified



A. a- Regeneration, b- CO_2 fixation, c-Reduction, d-Phosphorylation

B. a-CO_2 fixation, b-Phosphorylation, c-Reduction, d-Regeneration

C. a- CO_2 fixation , b- Phosphorylation, c- Regeneration, d-Reduction

D. a- CO_2 fixation, b-Reduction, c-Phosphorylation, d-Regeneration.

Answer: B

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565. Photorespiration produces

A. Sugar but not ATP

B. ATP but no sugar

C. Both ATP and Sugar

D. Neither ATP nor sugar.

Answer: D

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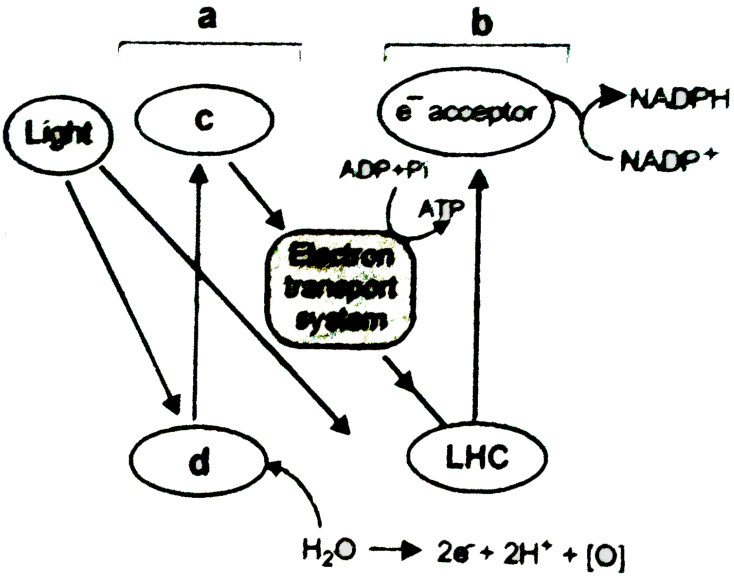
566. Which is correctly labelled



A. a- PS II, b-PS I, c-e^- acceptor, d- LHC

B. a- e^- acceptor, b-LHC, c-PS II, d- PS I

C. a-LHS, b- e^- acceptor, c-PS I, d- PS II

D. a- PS I, b- PS II, c- e^- acceptor, d- LHC.

Answer: A

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567. Which is water soluble

A. Phycobilin

B. Carotene

C. Xanthophyll

D. Chlorophyll.

Answer: A

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568. Non-cyclic photophosphorylation results in production of

A. ADP

B. ATP

C. $NADPH$

D. ATP and $NADPH$.

Answer: D

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569. The first product of C_4 pathway is

A. OAA

B. PGA

C. PGAL

D. DHAP.

Answer: A

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570. Which is aaociated with electron transport in photosynthesis

A. Sodium

B. Potassium

C. Iron

D. Cobalt.

Answer: C

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571. Photorespiration is a characteristic feature of plants having

A. C_4 cycle

B. C_3 cycle

C. Aerobic respiration

D. None of the above.

Answer: B

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572. Amongst red, blue and violet wavelengths, which one is most efficient for photosynthesis

A. Red

B. Blue

C. Violet

D. None of the above.

Answer: A

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573. Find out the correct combinations concerning components of photosynthetic electron transport location in relation to thylakoid and action

I. OEC- lumen side - water reduction

II. Plastocyanin - lume side - electron transfer from cyt f to PS I

III. Ferredoxin - stroma side -resuction of NAD^+ to NADH

IV. Cytochrome complex- integral protein - transfer electrons from PQH_2 to PC

Choose the correct answer

A. II and IV

B. I and III

C. II and III

D. I and IV.

Answer: A

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574. If $9ATP$ and $6NADPH$ are utilised for carbon assimilation through Calvin cycle, what would be the ratio of erythrose 4-phosphate, xylulose 5-phosphate and ribulose 5-phosphate during regeneration phase

A. $3:1:2$

B. $2:2:1$

C. $2:3:1$

D. $1:2:3$

Answer: D

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575. Bundle sheath cells

A. Lack RuBisCO

B. Lack both RuBisCO and PEP carboxylase

C. Are rich in RuBisCO

D. Are rich in PEP carboxylase.

Answer: C

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576. Extrusion of electron from reaction centre of PS II leaves a hole which is filled by electron released from

A. H_2O

B. CO_2

C. Chlorophyll

D. Light.

Answer: A

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577. In photorespiration, glycine passes from

A. Chloroplast to peroxisome

B. Chloroplast to mitochondrion

C. Peroxisome to mitochondrion

D. Mitochondrion to peroxisome.

Answer: C

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578. Reducing power generated during light reaction is used during formation of

A. 3-phosphoglyceraldehyde from RuBP

B. Sucrose from triose phosphate

C. Glyceraldehyde 3-phosphate from 3-phosphoglycerate

D. RuBP from triose phosphate.

Answer: C

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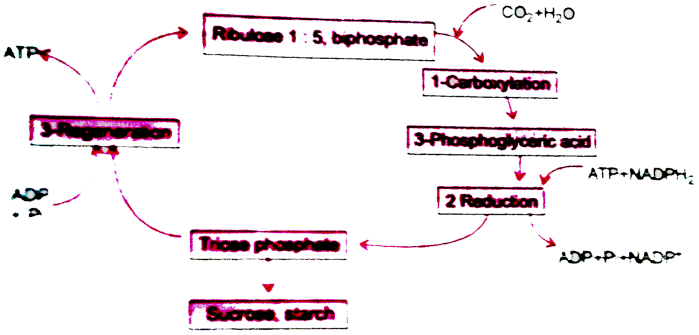
579. What does the following diagram show



A. Krebs cycle

B. Cyclic photophosphorylation

C. Calvin cycle

D. Non-cyclic photophosphorylation.

Answer: C

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580. Which of the following reactions is given by van Niel

A. $2H_2O + CO_2 \xrightarrow{\text{light}} CH_2O + H_2O + O_2$

B. $CO_2 + H_2O \xrightarrow{\text{light}} CH_2O + O_2$

C. $6O_2 + 12H_2O \xrightarrow{\text{light}} C_6H_{12}O_6 + 6H_2O$+6CO_(2)`

D. $2H_2O + CO_2 \xrightarrow{\text{light}} CH_2O + H_2O.$

Answer: A

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581. Assimilatory power is

A. $NADPH_2$

B. ATP

C. ATP and $NADPH_2$

D. $FADH_2$.

Answer: C

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582. Electrons from excited chlorophyll molecule of photosystem II are accepted first by

A. Ferredoxin

B. Pheophytin

C. Cytochrome b

D. Cytochrome f.

Answer: B

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583. C_4 plants absorb more light

A. C_4 plants absorb more light

B. C_4 plants absorb more CO_2

C. C_4 plants do not perform photorespiration

D. C_4 plants have more amount of RuBisCO.

Answer: C

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584. Assertion. Efficiency of C_4 plants is more than that of C_3 plants Reason. C_4 plants are more efficient in picking of CO_2

A. If both the with reason being correct explanation

B. both are true with reason being not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: A

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585. Select the characters not applicable to C_3 plants (i) Primary CO_2 acceptor is PEP (ii) The plants have RuBisCO (iii) Initial carboxylation reaction occurs in bundle sheath cells (iv) Calvin cycle occurs only in bundle sheath cells

A. iii and iv only

B. ii, iii and iv only

C. i and ii only

D. i, iii and iv only.

Answer: D

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586. Chemiosmotic hypothesis of ATP synthesis in chloroplasts is based on

A. Accumulation of K^+ ions

B. Proton gradient

C. Accumulation of Na ions

D. Membrane potential

Answer: B

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587. The microelement which is an integral part of electron carrier that transfers electrons electrons from cyt b-f complex to PS I is also a component of

A. Nitrate reductase

B. Cytochrome c-oxidase

C. IAA-oxidase

D. Dinitrogenase.

Answer: B

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588. Which is the major photosynthetic pathway in plants

A. C_3

B. C_4

C. CAM

D. None of the above.

Answer: A

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589. PAR is

A. Photosynthetically adaptable radiation

B. Photosynthetically accessible radiation

C. Photosynthetic activity radiometry

D. Photosynthetically active radiation.

Answer: D

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590. In PS, the reaction centre chlorophyll a has an absorption peak at

A. 650 nm

B. 660 nm

C. 680 nm

D. 700 nm.

Answer: D

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591. The ideal of two pigment systems in light reaction of photosynthesis was given by

A. Arnon

B. Hill

C. Blackman

D. None of the above.

Answer: D

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592. Chlorophyll molecules are located in

A. Thylakoid membrane

B. Thylakoid lumen

C. Stroma

D. Inner chloroplast membrane.

Answer: A

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593. Identify the correct statement (s) in relation to C_4 photosynthesis

(a) Kranz anatomy is an essential feature for C_4 plants

(b) C_4 plants have higher water use efficiency than C_3 plants

(c) Photorespiration is minimised in C_4 pathway

(d) Conversion of oxaloacetate to malate occurs in bundle sheath cells

A. a and b

B. a, b and c

C. b and c

D. b, c and d.

Answer: B

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594. Assertion (A). Higher yield in case of bell pepper can be achieved by growing them in CO_2 enriched green houses

Reason (R). Due to higher intracellular CO_2 concentration in bundle sheath cells, RuBisCO mainly acts as carboxylating enzyme

A. A is true but R is false

B. A is false but R is true

C. Both A and R are true and R is correct xplanation of A

D. Both A and R are true but R is not correct explanation of A.

Answer: A

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595. The from of carbon used for carboxylation of phosphoenol pyruvate in C_4 plants is

A. H_2CO_3

B. C_2H_4

C. CH_4

D. HCO_3^-

Answer: D

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596. Statement a. Photorespiration decreases photosynthetic output.

Statement b. In photorespiratory pathway, neither ATP no NADPH is produced

A. Both the statements a and b are correct

B. Both the statements a and b are wrong

C. Statement a is correct and statement b is wrong

D. Statement b is correct and statement a is wrong.

Answer: A

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597. the step at which NADPH is required in Calvin cycle

A. Carboxylation

B. Regeneration

C. Reduction

D. Phosphorylation.

Answer: C

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598. Synthesis of one glucose molecule requires- reduced NADP molecules

A. 6

B. 12

C. 18

D. 24

Answer: B

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599. Which one show dimorphic chloroplasts

A. Mango

B. Castor

C. Banyan

D. Amaranthus.

Answer: D

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600. Enzymes required for photophosphorylation are located in .....

Of chloroplast

A. Peristromium

B. Plastidome

C. Stroma

D. Quantasome.

Answer: D

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601. Which statement regarding cycling flow of electrons during light reactions is false

A. The process takes place in stromal lamella

B. ATP synthesis takes place

C. $NADP + H^+$ is synthesised

D. Takes place only when light of wavelength beyond 680 nm is available for excitation.

Answer: D

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602. Find out the mismatched pair

A. C_4 plants - Kranz anatomy

B. Primary CO_2 fixation product of C_4 plants -OAA

C. Primary CO_2 acceptor of C_3 plants - RuBP

D. Calvin pathway of C_3 plants occurs in - bundle sheath

Answer:

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603. Assertion. Photorespiration interfers with successful functioning of calvin cycle.

Reason. Photorespiration oxidises ribulose 1, 5-bisphosphate which is an acceptor of CO_2 in calvin cycle.

A. If both the with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: A

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604. Assertion. In light reaction of photosynthesis, light is required for the functioning of PS I and PS II and Production of NADPH and ATP.

Reason. Dark reaction does not occur in light.

A. If both the with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: C

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605. Carbon dioxide is necessary for photosynthesis. The chemical used to remove this gas most effectively from entering a control apparatus is

A. Calcium oxide

B. Distilled water

C. Potassium hydroxide solution

D. Sodium carbonate.

Answer: C

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606. Chromatophores take part in

A. Photosynthesis

B. Growth

C. Movements

D. Respiration.

Answer: A

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607. In photosynthesis, light independent reactions take place at

A. Thylakoid lumen

B. Photosystem I

C. Photosystem III

D. Stromal matrix.

Answer: D

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608. Mn, Ca and Cl present in PS II play an important role in

A. Absorption of light

B. CO_2 assimilation

C. Photolysis of water

D. ATP synthesis.

Answer: C

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609. The visible prtion of light spectrum useful in photosynthesis is referred to as

A. RFLP

B. PAR

C. VAM

D. VNTR.

Answer: B

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610. The time taken from the fixation of CO_2 to the formation of one glucose molecules is about..... Seconds

A. 20

B. 40

C. 60

D. 90

Answer: D

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611. Which one of the following is a CAM plant

A. Maize

B. Kalanchoe

C. Sugarcane

D. Jowar.

Answer: B

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612. Photorespiration requires this activity by an enzyme

A. Hydrolase

B. Oxygenase

C. Carboxylase

D. ATPase.

Answer: B

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613. This is not a C_3 plant

A. Amaranth

B. Rice

C. Wheat

D. Potato.

Answer: A

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614. An example of CAM plant is

A. Black Nightshade (Salanum nigrum)

B. Lemon Grass (Cymbopogon flexuosus)

C. Sugarbeet (Beta vulgaris)

D. Snake Plant (Sanseveria trifasciate).

Answer: D

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615. C_4 pathway is advantageous over C_3 pathway in plants as it

A. Occurs in relatively low CO_2 concentration

B. Uses more amount of water

C. Occurs in relatively low O_2 concentration

D. Is less efficient in energy utilisation.

Answer: A

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616. ATP synthesis in cell requires

A. H^+ gradient across the membrane

B. K^+ gradient across the membrane

C. PO_4^{3-} gradient across the membrane

D. Ca^{2+} gradient across the membrane.

Answer: A

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617. Number of ATP molecules formed from 8 molecules of water due to noncyclic electron transport and subsequent photophosphorylation is

A. 8

B. 4

C. 16

D. 12

Answer: C

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618. Correct sequence of involvement of the following in noncyclic electron transport

(i) PC (ii) PQ (iii) $Pheo$ (iv) Fd

A. ii, i, iii, iv

B. iii, ii, iv, i

C. iv, i, ii, iii

D. $iii, ii, i, iv.$

Answer: D

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619. Choose the correct statement

A. Stroma lamella membrane lacks PS II and PS I

B. When PS I is functional, electron flow in a noncyclic way

C. ATPase enzyme consists of F_0 and F_1 units

D. NADP reductase is a part of PS II.

Answer: C

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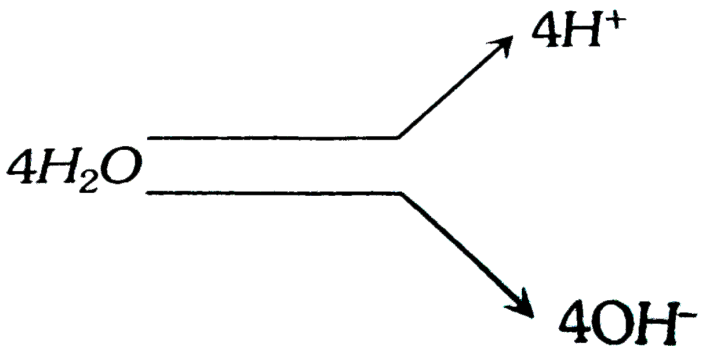

620.

In this process which of the following play important role

A. Chlorophyll

B. Light energy

C. Ca, Mn, Cl

D. All the above.

Answer: D

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621. how many molecules of ATP and NADPH are require in formation of two molecules of glucose ? How many calvin cycles are required

A. 36 ATP, 24 NADPH, 12 Calvin cycles

B. 36 ATP, 24 NADPH, 6 Calvin cycles

C. 18 ATP, 12 NADPH, 6 Calvin cycles

D. 24 ATP, 36 NADPH, 12 Calvin cycles

Answer: A

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622. During photorespiration, which compounds are formed having 2C and 3C respectively in Perxisome

A. Glycolate, glucine

B. Serine, glycine

C. Glycine, glycerate

D. Phosphoglycerate glycolate.

Answer: C

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623. The enzyme resonsible for primary carboxylation in C_3 plants is

A. Hexokinase

B. RuBP carboxylase-oxygenase

C. Pyruvate carboxylase

D. Succinate dehydrogenase.

Answer: B

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624. What is the quantum yield of photosynthesis

A. $33\ \%$

B. $9\ \%$

C. $12\ \%$

D. $78\ \%$

Answer: C

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625. 3-phosphoglyceric acid as first CO_2 fixation product in algal photosynthesis was discovered by

A. Priestley

B. Ingenhousz

C. Engelman

D. Calvin.

Answer: D

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626. Match and find the correct combination

(a) Chlorophyll a	(i) Yellow
(b) Chlorophyll b	(ii) Bright or blue green
(c) Xanthophyll	(iii) Yellow, yellow orange
(d) Carotenoids	(iv) Yellow green

A. a-ii, b-iv, c-i, d-iii`

B. a-iii, b-iv, c-ii, d-i

C. a-iv, b-iii, c-ii, d-i

D. a-iv, b-ii, c-i, d-iii

Answer: A

627. Maximum absorption of light by chlorophyll a occurs in which regions of the absorption spectrum (a) Blue (b) Red (c) Green (d) Yellow

A. a and b only

B. b and c only

C. a and d only

D. b and d only

Answer: A

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628. Cyclic photosphorylation results in the formation of

A. $NADPH + H^+$

B. ATP and $NADPH + H^+$

C. ADP

D. ATP

Answer: D

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629. How many molecules of ATP are required during the formation of one molecule of glucose

A. 8

B. 18

C. 28

D. 2

Answer: B

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630. Oxygen released in photosynthesis is formed during

A. Oxidative phosphorylation

B. Cyclic photophosphorylation

C. Noncyclic photophosphorylation

D. Carbon assimilation during dark reactions.

Answer: C

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631. The strong inhibitor substance for PS II in photosynthesis is

A. Ethylene

B. Chloroform

C. Dichlorophenyl dimethyl urea

D. Yellow light.

Answer: C

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632. The common feature in CAM and C_4 plants is

A. Stomata open only during night

B. Acid concentration increases during night

C. Both C_3 and C_4 pathways occur

D. Having kranz anatomy.

Answer: C

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633. Photosynthesis is considered as an oxidation reaction, because

A. CO_2 is oxidised

B. H_2O is oxidised

C. O_2 is released

D. (CH_2O) is oxidised

Answer: B

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634. A plant is provided with ideal conditions for photosynthesis and supplied with isotope $.^{14}CO_2$. When the products of the process are analysed carefully, what would be nature of products

A. Both glucose and oxygen are labelled

B. Only oxygen is labelled but glucose is normal

C. Both glucose and oxygen are normal

D. Only glucose is labelled and oxygen is normal.

Answer: D

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635. Evolution of oxygen during photosynthesis is a

A. Light reaction

B. Dark reaction

C. Respiratory influence

D. Both light and dark reactions.

Answer: A

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636. Which of the following statements is characteristic feature of CAM plants

A. Release oxygen during day

B. Release oxygen during night

C. Open their stomata during night

D. Do not respire during dat.

Answer: C

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637. Magnesium in chlorophyll molecule is located in

A. Centre of porphyrin head

B. Corner of porphyrin head

C. Phytol tail

D. None of the above.

Answer: A

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638. Which set of pigments are involved in green plant photosynthesis

A. Chlorophylls, carotenoids and anthocyanins

B. Chlorophylls, carotenoids and betacyanins

C. Chlorophylls, carotenoids and phycobilins

D. Chlorophylls, carotenes and xanthophylls.

Answer: D

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639. CAM plants open their stomata during night only because they tend to

A. Pormote the rate of light reaction

B. Promote rate of dark reaction

C. Minimise rate of transpiration

D. Maximise rate of transpiration.

Answer: C

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640. Which statement is not correct about photosynthesis in Ficus religiosa

A. It releases O_2 during day

B. It releases oxygen during night

C. It release CO_2 during night

D. It releases CO_2 and O_2 during day.

Answer: B

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641. What conclusion was drawn from red drop and enhanement experiments in the light reaction of photosynthesis

A. Two photosystems are present

B. One photosystem is present

C. Two photosystems are present which work at different wavelengths

D. Two photosystems are present which work at some wavelength.

Answer: C

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642. How many ATPs are required by C_4 plants in synthesis of one molecule of glucose

A. 18 ATP

B. 30 ATP

C. 12 ATP

D. None of the above.

Answer: B

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643. Light reaction during photosynthesis takes place in

A. Outer surface of chloroplast envelope

B. Stroma

C. Thylakoid membrane

D. Inner surface of chloroplast envelope.

Answer: C

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644. Which is not true about cyclic photophosphorylation

A. O_2 is not released

B. Photolysis of water does not take place

C. No NADH is produced

D. Only P_{680} is involved.

Answer: D

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645. What did Engelmann observe from his prism experiments

A. Bacteria could not detect the sites of O_2 evolution

B. Bacteria released excess carbon dioxide in red and blue light

C. Bacteria accumulated due to increase in temperature caused by increase in O_2 concentration.

D. Bacteria are accummulated towards red and blue light.

Answer: D

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646. How many NADPH and ATP molecules are used in Calvin cycle for production of trioses required for synthesis of 6 surcose molecules

A. 144 NADPH, 216 ATP

B. 288 NADPH, 432 ATP

C. 144 NADPH, 288 ATP

D. 72 NADPH, 108 ATP.

Answer: A

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647. Photosynthetic reaction centre from photosynthetic bacterium was crystallised by

A. Gulirrez

B. Burnell and Hatch

C. Fluggs and Heldt

D. Hunber, Mutchel and Deisenhofer.

Answer: D

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648. Choose the correct option for the chloroplast of bundle sheath from the following

A. They show grana organisation

B. They do not show grana organisation

C. They do not possess, thylakoids.

D. They possess thylakoid and grana organisation.

Answer: B

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649. Splitting of water molecules during light reaction of photosynthesis is associated with (a) PS I resulting the release of O_2

, protons and transfer of electrons to PS II (b) PS II resulting in release of O_2, protons and transfer of electrons to PS I (c) PS II resulting in release of O_2, protons and transfer of electrons to PS II (d) PS I resulting in the release of O_2, protons and transfer of electrons to PS I.

Of the above statements

A. a alone is correct

B. b alone is correct

C. c alone is correct

D. d alone is coorect

Answer: B

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650. Kranz anatomy is not seen in (i) Maize (ii) sorghum (iii) Tomato.

A. i and ii

B. i and ii

C. i only

D. iii only

Answer: D

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651. On photorespiration the number of ATP and NADPH synthesised are respectively

A. 1 and 3

B. 2 and 3

C. 3 and 4

D. O and O

Answer: D

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652. Photo-respiratory reactions are operated in

A. Chloroplasts, ribosomes and peroxisomes

B. Chloroplasts, mitrochondria and peroxisomes

C. Mitochndria, peroxisomes and lysosomes

D. Mitochondria, chloroplasts and ribosomes.

Answer: B

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653. Stomata remain open at night in

A. C_3 plants

B. C_4 plants

C. CAM plants

D. Hydrophytic plants.

Answer: C

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654. The entire reactions of C_4 pathway take place in

A. Mesophyll and bundle sheath

B. Vascular bundle and palisade tissue

C. Mitochondria and peroxisomes

D. Bundle sheath and endoplasmic reticulum.

Answer: A

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655. A plant in your graden avoids photorespiratory loss, has improved water use efficiency, shows high rate of photosynthesis at high temperatures and has improved efficiency of nitrogen utilisation. In which of the following physiological groups would you assign this plant

A. Nitrogen fixer

B. C_3

C. C_4

D. $CAM.$

Answer: C

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656. Emerson's enhancement effect and red drop have been instrumental in the discovery of

A. Oxidative phosphorylation

B. Photophosphorylation and noncyclic electron transport

C. Two photosystems operating simultaneously

D. Photophosphorylation and cyclic electron transport

Answer: C

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657. In chloroplast, the highest number of protons are found in

A. Antenna complex

B. Stroma

C. Lumen of thylakoids

D. Inter-membrane space

Answer: C

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658. The process which makes major difference between C_3 and C_4 plants is

A. Respiration

B. Glycolysis

C. Calvin cycle

D. Photorespiration.

Answer: D

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659. Assertion : CAM plants lack structural compartmentation of leaf, as found in C_4 plant

Reason : Stomata of CAM plants are open during the day.

A. If both are true with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: C

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660. Assertion : Photorespiration is a useful process where there is no synthesis of ATP energy.

Reason : RuBisCO is present in mesophyll cells of C_4 plants, hence they show more productivity.

A. If both are true with reason being correct explanation

B. both true but reason is not correct explanation

C. assertion is true but reason is wrong

D. both are wrong.

Answer: C

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661. C_4 plants have better productivity because

A. C_4 plants absorb more light

B. C_4 plants absorb more CO_2

C. C_4 plants lack photorespiration

D. All the above.

Answer: D

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662. With reference to factors affecting the rate of photosynthesis, which of the following statements is not correct ?

A. Light saturation for CO_2 foxation occurs at 10 % of full sunlight

B. Increasing atmspheric CO_2 concentration upto 0.05 % can enhance CO_2 fixation rate

C. C_3 plants respond to higher temperature with enhanced photosynthesis while C_4 plants have much lower temperature optimum.

D. Tomato is a greenhouse crop which can be grown in CO_2 enriched atmosphere for higher yield.

Answer: C

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Cyg

1. Solar radiations contain ultraviolet radiations of wavelength

A. 100-390 nm

B. 300-390 nm

C. 100-200 nm

D. 200-390 nm.

Answer:

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2. Soil humus theory of plant nourishment was given by

A. Aristole

B. Liebig

C. Von Helmont

D. Ingen-Housz.

Answer: B

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3. Chlorophyll a is called universal photosynthetic pigment because it occurs in

A. All photoautotrophs

B. All eucaryotic photoautotrophs

C. All oxygenic photoautotrophs

D. Both oxygenic and anoxygenic photoautotrophs.

Answer:

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4. Which one is Hill oxidant ?

A. Indophenol

B. Dichlorophenol

C. Ferricyanide, chromate and benzoquinone

D. All the above.

Answer:

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5. Action spectrum of photosynthesis was discovered by

A. Calvin

B. Engelmann

C. Blackman

D. Hill.

Answer:

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6. Girdling experiments cannot be successful in case of Cucurbita because it

A. Does not possess secondary growth

B. Has scattered vascular bundles

C. Possesses bicollateral bundles

D. All the above.

Answer:

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7. First transitory chemical formed by reaction between CO_2 and RuBP is

A. $PGAL/GAP$

B. PGA

C. Dihydroxy acetone phosphate

D. 2-Carboxy 3 keto biphosphosphoribotol.

Answer:

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8. $PEPco$ occurs in

A. All photosynthetic tissues

B. C_4 plants

C. CAM plants

D. Both C_4 and CAM plants.

Answer:

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9. the acientist who discovered atmospheric CO_2 concentration to be suboptimal for photosynthesis is

A. Godlewski

B. Bossingault

C. Dutrochet

D. De Saussure.

Answer:

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10. Wilmott's bubbler is meant for ptoving

A. CO_2 is necessary for photosynhesis

B. Light is necessary for photosynthesis

C. Oxygen is evolved during photosynthesis

D. Chlorophyll is essential for photosynthesis.

Answer:

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