BIOLOGY

BOTANY AND ZOOLOGY FOR NEET AND AIIMS

PHOTOSYNTHESIS IN HIGHER PLANTS

Exercise I

1. The Correct equation of photosynthesis is

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

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

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

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

Answer: C

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2. It serves as both reactant and a product in the photosynthetic process of higher plants

A. CO_2

B. O_2

C. H_2O

D. glucose

Answer: C

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3. In higher plants the by product of photo-synthesis is

A. O_2

B. H_2O

C. Carbohydrates

D. ATP

Answer: A

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4. Photosynthesis is

A. Physico biochemical process

B. Anabolic process

C. Endergonic reaction

D. all the above

Answer: D

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5. Oxygenic photosynthesis occurs in

A. Chromatium

B. Chlorella

C. Rhodospirillum

D. Chlorobium

Answer: B

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6. In photosynthesis , oxygen is liberated due to

A. Reduction of carbon dioxide

B. Hydrolysis of carbohydrate

C. Photolysis of water

D. Breakdown of chlorophyll

Answer: C

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7. The first event in photosynthesis is

A. Synthesis of ATP

B. Photoexcitation of chlorophyll

C. Photolysis of water

D. Release of oxygen

Answer: B

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8. Ultimate source of hydrogen atoms for the synthesis of glucose is

A. H_2O

B. NAPH

C. FADH

D. $n(CH_2O)$

Answer: A

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9. Plants stone glucose as

A. Monosaccharides

B. Cellulose

C. Starch

D. Glycogen

Answer: C

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10. Plants do not store carbohydrates as glucose, because it

A. Dissolves an water , thereby altering the osmotic balance

B. Attracts insects herbivores

C. Is an unstable molecule

D. Would replace ribose in DNA synthesis

Answer: A

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11. Which one of the following statements about photosynthesis is not true ?

A. All green plants photosynthesize

B. Only green plants photosynthesize

C. Carbon dioxide is reduced during photosynthesis

D. Some bacteria also photosynthesize

Answer: B

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12. Which organism does not evolve oxygen in photosynthesis ?

A. Anabaena

B. Funaria

C. Pisum

D. Rhodospirillum

Answer: D

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13. Anoxygenic photosynthesis do not involved

A. Photosystems

B. ATP synthesis

C. CO_2 fixation

D. Photolysis of water

Answer: D

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14. Photosynthesis first occurred in

A. Cyanobacteria

B. Green plants

C. Mycoplasma

D. Green algae

Answer: A

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15. Light is necessary in the process of photosynthesis for

A. Splitting of CO_2

B. Production of ATP and reducing power (NADPH)

C. Combining CO_2 and H_2O

D. Releasing energy from glucose

Answer: B

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16. During the process of photosynthesis , O_2 in glucose comes from

A. CO_2

B. H_2O

C. Both (1) & (2)

D. O_2 in air

Answer: A

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17. The green plants are grown in aquarium for

A. CO_2

B. O_2

C. Fish food

D. None of these

Answer: B

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18. Which statement about photosynthesis is false

A. The electron carriers involved in phosphorylation are located on the thylakoid membranes

B. Photosynthesis is a redox process, in which water is oxidised and carbondioxide is reduced

C. The enzymes required for carbon fixation are located on grana of chloroplast

D. In green plants, both PS - I and PS = II are required for the formation of $NADPH + H^+$

Answer: C

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19. During photosynthesis

A. Water gets oxidised

B. Carbondioxide get reduced

C. Oxygen is evolved as byproduct

D. All the above

Answer: D

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20. True statements regarding photosynthesis

A. It takes place during day time

B. It takes place in all green cells

C. It is redox process

D. All the above

Answer: D

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21. During bacterial photosynthesis

A. H_2S gets oxidised

B. Carbondioxide get reduced

C. Sulphur is evolved as a by product

D. All the above

Answer: D

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22. Major amount of photosynthesis is performed by

A. Diatoms

B. Dinoflagellates

C. Euglenoids

D. Prozoans

Answer: A

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23. Engleman's experiments with green algae demonstrated that

A. The full spectrum of sunlight is needed for photosynthesis

B. Only red wavelength is effective in causing photosynthesis

C. Only blue wavelength is effective

D. Both blue and red wavelength are effective in causing photosynthesis

Answer: D

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24. Who demonstrated experimentally that sun light is essential to plants for purifying the air fouled by burning candle or breathing animals

A. Joseph Priestley

B. Jan Ingenhousz

C. FF Blackman

D. T W Englman

Answer: B

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25. Who conducted first action spectrum experiments by using 'Blue and red ' light exposed to' Cladophora' in aerobic bacterial suspension

A. Julius von Sachs

B. Jan Ingenhousz

C. T.W Englemann

D. D.Arnon

Answer: C

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26. Fd-NADP reductase is located

A. in stroma of chloroplast

B. in lumen

C. on the surface of thylakoid membrane towards stroma

D. in periplastidial space

Answer: C

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27. Mohl's half leaf experiment demonstrates the importance of

A. Light for Photosynthesis

B. CO_2 for Photosynthesis

C. Chlorophyll for Photosynthesis

D. H_2 for Photosynthesis

Answer: B

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28. Choose the incorrect match regarding early experiments on photosynthesis

A. Plants take CO_2 and release oxygen - Joseph Priestley

B. The empirical equation of an oxygenic photo-synthesis -Van Neil

C. First action spectrum of Photosynthesis Engelmann

D. Evidence for production of glucose in chloroplast - Ingenhouz

Answer: D

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29. Scientist who first discovered the role of light in photosynthesis

A. Sachs

B. Priestly

C. Senebier

D. Ingen Housz

Answer: D

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30. The process of photophosphorylation was discovered by

A. Priestley

B. Warburg

C. Arnon

D. Calvin

Answer: C

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31. Variegated leaf experiment demonstrates that

A. Water is necessary for Photosynthesis

B. Carbon dioxide is necessary for Photosynthesis

C. Oxygen is necessary for Photosynthesis

D. Chlorophyll necessary for Photosynthesis

Answer: D

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32. Radioactive isotope of oxygen (O_{18}) was used to know the source of oxygen released through Photosynthesis by

A. Hill

B. Van Neil

C. Ruben and Kamen

D. Hatch and Slack

Answer: C

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33. Which of the following scientists reported that O_2 comes from water during Photosynthesis by using potassium ferricyanide

A. Van Neil

B. Ruben

C. Hill

D. Ruben and Kamen

Answer: C

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34. Discovery of Emerson effect has clearly shown the existence of

A. Photorespiration

B. Photophosphorylation

C. Light and dark reaction in Photosynthesis

D. Two distinct photochemical reactions or processes

Answer: D

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35. 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

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36. For demonstration of Photosynthesis experiments , usually aquatic plant Hydrilla is used not any terrestrial plant, why?

A. It carries out faster Photosynthesis

B. O_2 released throughout and can accumulate over the water

C. It respires slowly

D. None of the above

Answer: B

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37. Identify the correct match regard to Photosynthesis experiments

List-I

A) Variegated leaf experiment

B) Half-leaf experiment

C) Light screen experiment (Leaf that was covered partially with black paper)

D) Engelmann's experiment

List = II

I) Action spectrum

II) Synthesis of starch

III) Chlorophyll is necessary

IV) Light is necessary

V) CO_2 is necessary

A. A - V , B -I , C - II , D - IV

B. A - III , B - V , C - IV , D - I

C. A - IV , B -III , C - I , D - V

D. A - III , B -V , C - IV , D - II

Answer: B

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38. Which metal ion a constituent of Chlorophyll?

A. Iron

B. Copper

C. Magnesium

D. Zinc

Answer: C

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39. Which pigment acts directly to convert light energy to chemical energy ?

A. Chlorophyll a

B. Chlorophyll b

C. Xanthophyll

D. Carotenoid

Answer: A

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40. Which range of wavelength (in nm) is called photo-synthetically active radiation (PAR)?

A. 100 - 390

B. 390 - 430

C. 400 - 700

D. 760 - 100, 00

Answer: C

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41. Which light range is least effective in Photosynthesis ?

A. Blue

B. Green

C. Red

D. Violet

Answer: B

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42. In mesophyll cells at high light intensity chloroplasts are found

A. Scattered in the cell sap

B. Aligned around the nucleus

C. Aligned along the walls

D. Clustered in the cell

Answer: C

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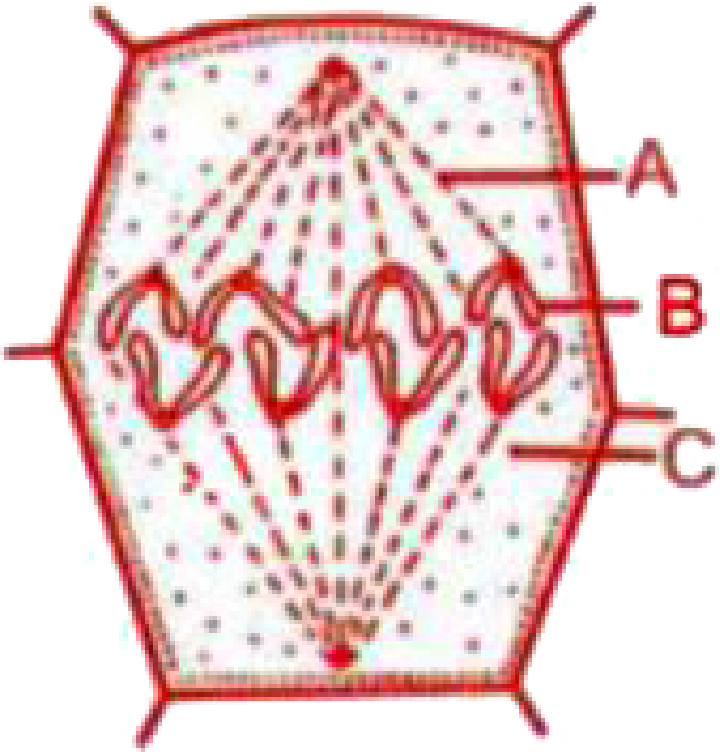
43. Identify the labelled parts of following diagram



A.

X	Y	Z
Dark reaction	Light reaction	Cytoplasmic inheritance

B.

X	Y	Z
Light reaction	Carbohydrate synthesis	Carbohydrate storage

C.

X	Y	Z
Light reaction	Carbohydrate synthesis	Carbohydrate storage

D.

X	Y	Z
Carbohydrate synthesis	Carbohydrate storage	Cytoplasmic in

Answer: B

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44. Pigments present in Blue Green Algae include

A. Chlorophyll 'a'

B. Phycocyanin

C. Phycoerythrin

D. All the above

Answer: D

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45. Pigments which are not found in higher plants are

A. Chlorophyll -a

B. Chlorophyll - b

C. Carotenoids

D. Phycobilins

Answer: D

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46. Photo oxidation of chlorophyll-a in the reaction centre is prevented by

A. Lutein

B. β caroten

C. Phycoerythrin

D. All

Answer: D

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47. Chlorophylls don't absorb this wave length of light

A. Red wave length

B. Green wavelength

C. Blue wavelength

D. Organe wavelength

Answer: B

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48. Blue green pigment is

A. Phycocyanin

B. Phycoerythrin

C. Plastocyanin

D. P_{680}

Answer: D

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49. Energy transuding membrane in chloroplast is

A. Outer unit membrane

B. Inner unit membrane

C. Thylakoid membrane

D. Cristae

Answer: C

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50. In chloroplasts, pigments are bound to

A. Proteins

B. Carbohydrates

C. Lipids

D. Cellulose

Answer: A

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51. Porphyrin head in Chlorophyll molecule

A. Consists of four pyrrole rings

B. Pyrrole rings are linked in a cyclic maner

C. Pyrrole rings are linked with magnesium atom

D. All the above

Answer: D

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52. Difference between Chlorophyll'a' and 'b' is regarding this carbon atom of 2^{nd} pyrrole ring

A. 3^{rd}

B. 2^{nd}

C. 4^{th}

D. 5^{th}

Answer: A

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53. Bond found in between phytol tail and porphyrin head is

A. Ester

B. Hydrogen

C. Glycosidic

D. Phosphodiester

Answer: A

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54. Pigments which contain oxygen and nitrogen are

(A) Phycobilins (B) Carotenes

(C) Xanthophylls (D) Chlorophylls

A. A, D

B. B,C

C. A, C, D

D. D only

Answer: A

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55. Stroma in the chloroplasts of higher plants contain

A. light independent reaction enzymes

B. light dependent reaction enzymes

C. Coupling factor

D. Chlorophyll

Answer: A

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56. The correct molecular (chemical) formula for Chlorophyll 'a' is

A. $C_{55}H_{70}O_5N_4Mg$

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

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

D. $C_{55}H_{77}O_6N_4Mg$

Answer: C

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57. The correct molecular formula for Chlorophyll 'b' is

A. $C_{55}H_{72}O_4N_3Mg$

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

C. $C_{55}H_{70}O_5N_4Mg$

D. $C_{55}H_{77}O_6N_4Mg$

Answer: B

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58. Total types of chlorophyll pigments associated with PS-I and PS-II in higher plants are

A. One

B. Two

C. Three

D. Four

Answer: B

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59. In a plant cell, which of the following pigments participates participates directly in the conversation of light energy in photosynthesis

?

A. Chlorophyll a

B. Chlorophyll b

C. Chlorophyll d

D. Carotenoids

Answer: A

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60. The red, organe and yellow colours of autumn leaves are caused by light reflected from

A. Chlorophyll a

B. Chlorophyll b

C. Chlorophyll d

D. Carotenoids

Answer: D

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61. A solution of Chlorophyll pigments looks red in reflected light because of

A. Diffraction

B. Fluorescence

C. Reflection

D. Refraction

Answer: B

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62. Pigments of PSI are present in

A. Appressed part of grana

B. Stromal thylakoid & non appressed part of outer membrane of granal thylakoids

C. Both (1) and (2) 4)

D. None

Answer: B

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63. A Photosystem contains

A. Pigments , electron acceptor & hydrogen acceptor

B. Photons , Protons, Pigments & hydrogen acceptor

C. $PO_4, ADP\&H^+$

D. Both (1) and (2)

Answer: A

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64. In Chlorophyll 'a' CH_3 group is attached at

A. 4^{th} pyrrole ring

B. 2^{nd} pyrrole ring

C. 3^{rd} pyrrole ring

D. 1^{st} pyrrole ring

Answer: C

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65. In photosynthesis , chlorophyll serves as

A. Hydrogen acceptor

B. Hydrogen donor

C. Energy convertor

D. Raw material

Answer: C

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66. The pigment Chlorophyll-a is absent in

A. Gymnosperms

B. Bacteria

C. Algae

D. Bryophyta

Answer: B

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

A. Chlorophyll-b

B. Carotene

C. Anthocyanin

D. Xanthophyll

Answer: B

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68. $C_{40}H_{56}O_2$ is the empirical formula of

A. Xanthophyll

B. Anthocyanin

C. Chlorophyll

D. Carotene

Answer: A

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69. Basic structure of all Chlorophylls comprises

A. Chtochrome system

B. Flavoproteins

C. Porphyrin system

D. Plastocyanin

Answer: C

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70. Which of the following photosynthetic prokatryote has both PS - I and PS - II ?

A. Purple sulphur bacteria

B. Cyanobacteria

C. Purple non-sulphur bacteria

D. Green-sulphur bacteria

Answer: B

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71. The head and tail of chlorophyll are made up of

A. Porphyrin and phytin

B. Pyrrol and tetrapyrrol

C. Porphyrin and phytol

D. Tetrapyrrol and pyrrol

Answer: C

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72. Photosynthetic bacteria have

A. Pigment system - I

B. pigment system - II

C. Both (1) & (2)

D. Some other kind of pigment , P_{890}

Answer: A

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73. Which of the following provides energy to ETS by absorption of sunlight ?

A. Chlorophyll

B. Mitochondria

C. ATP

D. Water

Answer: A

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74. Example of water soluble plant pigment is

A. Chlorophyll-a

B. Chlorophyll-P

C. Phycobilin

D. Xanthophyll

Answer: C

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75. Chlorophyll in chloroplasts is located in

A. Grana

B. Pyrenoid

C. Stroma

D. Both (1) and (2)

Answer: A

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76. In which of the following wavelength , photo system-I is inactive ?

A. 780 nm

B. 680 nm

C. 690 nm

D. 550 nm

Answer: D

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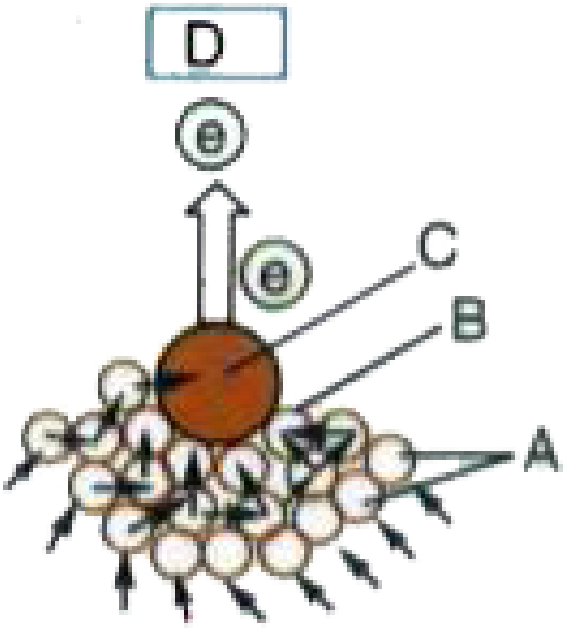
77. Given figure depicts the light harvesting complex (LHC) of Photosystem



Select the correct identification for A , B , C and D .

	A	B	C	D
A.	Core molecules	Antenna molecules	P_{680}	Primary e^- acceptor
	A	B	C	D
B.	Antenna molecules	Core molecules	P_{700}	Primary e^- acceptor
	A	B	C	D
C.	Antenna molecules	Core molecules	P_{700}	Plastocyanin
	A	B	C	D
D.	Core molecules	Reaction centre	P_{680}	Plastocyanin

Answer: B

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78. Chemosynthetic bacteria obtain energy from

A. Sun

B. infra red rays

C. organic substances

D. inorganic chemical

Answer: D

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79. 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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80. During light reaction in Photosynthesis the following are formed

A. ATP and sugar

B. hydrogen O_2 and sugar

C. ATP hydrogen donor and O_2

D. ATP, hydrogen and O_2 donor

Answer: C

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81. Splitting of water is associated with Photosystem I lumen of thylakoid both

A. Photosystem

B. lumen of thylakoid

C. both Photosystem I and II

D. inner surface of thylakoid membrane

Answer: B

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82. The correct sequence of flow of electrons in the light reaction is

A. PSII, plastoquinone , cytochromes, PSI ferredoxin

B. PSI, plastoquinone, cytochromes, PSI ferredoxin

C. PSI, ferredoxin, PSII

D. PSI, plastoquinone, cytochromes, PSII ferredoxin

Answer: A

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83. The splitting of water molecule is associated with

A. Photosystem I

B. Photosystem II

C. Cytochromes complex

D. Coupling factor

Answer: B

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84. Which one of the following is not a down hill movement of electrons is Z-scheme?

A. Pheophytin to PSI

B. LHC II to pheophytin

C. Ferredoxin to $NADP^+$

D. Both (1) & (3)

Answer: B

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85. The ultimate hydrogen acceptor and hydrogen donor, respectively in the photosynthesis of higher plants

A. Ferredoxin in $NADP^+$

B. $NADP^+$ and water

C. NADPH and OEC

D. PS II PS I

Answer: B

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86. How many " down hill" movements of electrons is found in the Z-scheme ?

A. 4

B. 5

C. 2

D. 1

Answer: C

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87. In the Z-scheme of e^- transport , PSII and PSI are connected by

A. NADPH

B. ATP

C. photos

D. Electron transport chain

Answer: D

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88. Source of protons necessary for the reduction of $NADP^+$ is

A. H_2O which undergoes oxidation

B. PQH_2 which undergoes oxidation

C. H^+ picked up by PQ^-

D. H^+ pool of stroma

Answer: A

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89. Stroma of chloroplast is associated with

A. OEC

B. Dark phase

C. Non-cyclie electron transport

D. Cyclic electron transport

Answer: B

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90. The mobile carriers during non-cyclic electron transport are

A. Plastosemiquinone and P_{700}

B. Plastosemiquinone and Phycocyanin

C. Plastosemiquinone and Plastocyanin

D. P_{680} and P_{700}

Answer: C

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91. In both cyclic and non cyclic Photophosphorylation/electron transport

A. ATP is produced

B. P_{700} is involved

C. quinone cycle operates

D. All the above

Answer: D

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92. Proton translocation is observed through a membrane complex present on thylakoid membranes namely

A. PS-II complex

B. PS-I complex

C. Cytochrome b_6 f complex

D. $CF_0 - CF_1$ complex

Answer: D

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93. Mineral elements involved in photolysis of water during Photosynthesis are

A. Mn and Mo

B. Ca and S

C. Mn and CI

D. Ca and Mg

Answer: C

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94. According to modern scheme of photosynthetic electron transport the correct sequence of electron transfer from excited 9700 to NADP + is

A. $A_1 \rightarrow A_0 \rightarrow F_x \rightarrow F_A/F_B \rightarrow Fd \rightarrow NADP^+$

B. $A_1 \rightarrow A_0 \rightarrow F_A/F_B \rightarrow Fx \rightarrow FNR \rightarrow NADP^+$

C. $A_0 \rightarrow A_1 \rightarrow F_A/F_B \rightarrow Fx \rightarrow NADP$

D. $A_0 \rightarrow A_1 \rightarrow Fx \rightarrow F_A/F_B \rightarrow Fd \rightarrow NADP^+$

Answer: D

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95. The primary electron acceptor in PSII is

A. Ferredoxin

B. PQ

C. Plastocyanin

D. Pheophytin

Answer: D

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96. Ferredoxin is

A. A polynucleotide with iron and sulfur

B. Chlorophyll without Mg

C. A polypeptide with iron and sulfur

D. A copper contain protein

Answer: C

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97. In photosynthetic ' Quinone cycle' the number of electrons transferred from PQH_2 to Cytochrome b_6 is

A. One

B. Two

C. Three

D. Four

Answer: A

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98. Mobile electron carriers attached loosely to the thylakoid membrane towards lumen side

A. OEC

B. PQ

C. PC

D. Fd

Answer: C

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99. In Hill's experiment on Photosynthesis, potassium ferric oxalate is used as an acceptor of

A. Oxygen

B. Hydrogen

C. Carbon

D. Nitrogen

Answer: B

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100. Photo synthetically active radiation (PAR)

A. 390 - 760 nm

B. 390 - 810 nm

C. 535 - 647 nm

D. 647 - 760 nm

Answer: A

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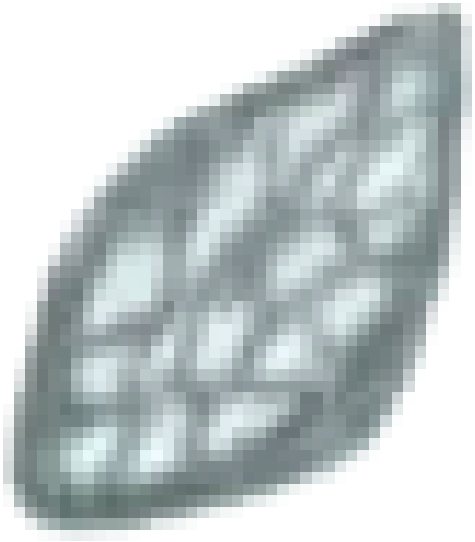
101. In Hill reaction potassium ferric oxalate is



A. Source of oxygen evolution

B. Reductant

C. Oxidant

D. Oxygen acceptor

Answer: C

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102. Photophosphorylaton is a process in which

A. Light energy is converted into chemical energy in the from of ATP

B. NADP is formed

C. Chemical energy is used to produce ATP

D. CO_2 is reduced to a carbohydrate

Answer: A

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103. The primary electron acceptor in cyclic photo phosphorylation is

A. A protein that contains iron and sulphur

B. Carbon dioxide

C. FAD

D. NADP

Answer: A

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104. Cyclic Photophosphorylation produces

A. ATP

B. ATP + NADPH

C. NADPH

D. ATP, NADPH & O_2

Answer: A

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105. The photosynthetic unit to trap the light energy is known as

A. Quantasome

B. Mesosome

C. Nucleosome

D. Oxysome

Answer: A

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106. Which of the following statements about absorption spectrum is correct ?

A. In blue region peak of Chl-b forms at lower wavelength than peak of Chl- 1

B. In red region height of peak of Chl-a is more than that of Chl-b

C. In blue region of peak of Chl-a is more than that of Chl-b

D. In red region peak of Chl-b forms at lower wavelength than that Chl-b

Answer: B

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107. Enhancement Effect for the rate of Photosynthesis, observed by Emerson is possible in the presence of

A. shorter wavelength of light

B. shorter wavelength of light

C. infrared wavelength

D. a combination of longer and shorter wavelength of light

Answer: D

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108. Which of the following constitutes assimilatory power of Photosynthesis

A. Glucose and fructose

B. NAD and FAD

C. ATP and $NADPH_2$

D. PSI and PS II

Answer: C

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109. In PS II, first known electron acceptor is

A. Cytochrome

B. PQ

C. FAS

D. Pheophytin

Answer: D

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110. During light reaction of Photosynthesis the electrons lost by pigment system II are compensated by

A. CO_2

B. H_2O

C. O_2

D. ATP

Answer: B

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111. DCMN kills the herbs by

A. inhibiting photoreactionII of Photosynthesis

B. checking electron transport system in photo-synthesis from is PS-II to is PS-I

C. inhibiting photoreaction-I of Photosynthesis

D. all of the above

Answer: B

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112. Which of the following electron carrier constrains copper ?

A. Ferredoxin

B. Cytochrome

C. Plastocyanin

D. Cytochrome I

Answer: C

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113. Functional unit of photosynthesis is known as

A. Electron

B. photon

C. Chlorophyll

D. Quantasome

Answer: D

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114. Photo centres in higher plants are

A. P_{700}

B. P_{680}

C. Both (1) & (2)

D. Chlorophyll - a

Answer: C

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115. The graph showing rate of Photosynthesis at different wavelengths of light is called

A. Absorption spectrum

B. Action spectrum

C. Both (1) and (2)

D. None of these

Answer: B

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116. Red drop occurs in wavelength of

A. 495 nm

B. 690 nm

C. 560 nm

D. 586 nm

Answer: B

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117. The number of oxygen molecules produced per-quantum of light absorbed is

A. Oxygen yield

B. Photosynthesis yield

C. Quantum yield

D. Organic yield

Answer: C

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118. What will be the direction of energy flow between PS-I and PS-II when two pigment system absorb light ?

A. $PS-II \rightarrow PS-I$

B. $PS-I \rightarrow PS-II$

C. $PS-II \Leftrightarrow PS-I$

D. None of these

Answer: A

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119. The normal state of an atom or molecule is known as

A. Ground state

B. Singlet state

C. Both (1) & (2)

D. Excited state

Answer: C

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120. Cyclic Photophosphorylation links to

A. PS-II

B. PS-I

C. dark reaction

D. Both (1) & (2)

Answer: B

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121. Light reaction of Photosynthesis occurs inside

A. stroma

B. Grana

C. Endoplasmic reticulum

D. Cytoplasm

Answer: B

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122. Which of the following statements is true with regard to the light reaction of Photosynthesis ?

A. In PS-II the reaction centre Chlorophyll-a has an absorption peak at 700 nm hence , is called P_{700}

B. In PS-II the reaction centre Chlorophyll-a has an absorption maxima at 680 nm and is called P_{680}

C. The splitting of water molecule is associated with PS-I

D. Photosystem-I and II are involved in Z scheme

Answer: D

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123. Photolysis of water during Photosynthesis occurs with the help of

A. PS- II

B. PS - I

C. Ferredoxin

D. Cytochrome

Answer: A

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124. Photosynthesis cannot continue for long if during light reaction . Only cyclic Photophosphorylation takes place. This is because

A. Only ATP is formed $NADPH^+ + H^+$ is not formed

B. Photosystem I-stops getting excited at a wavelength of light beyond 680 nm

C. There is unidirectional cyclic movement of the electrons

D. There is no evolution of oxygen

Answer: A

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125. What is true regarding PS-II ?

A. It takes longer wavelength of light and electrons from H_2O

B. It takes shorter wavelength of light and electrons from H_2O

C. It takes longer wavelength of light and electrons from NADP

D. It takes shorter wavelength of light and electrons from NADP

Answer: B

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126. Match the following and choose the correct combination from the given option

Column - I	Column - II
(A) Visible light	(1) $0.1 \text{ to } 1nm$
(B) Ultra violet	(2) $400 \text{ to } 700nm$
(C) X - rays	(3) Longer than 740 nm
(D) Infra - red	(4) $100 \text{ to } 400nm$
	(5) $< 0.1nm$

A.

A	B	C	D
1	3	4	5

B.

A	B	C	D
3	2	1	5

C.
A	B	C	D
4	3	2	1

D.
A	B	C	D
2	4	1	3

Answer: D

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127. Primary electron acceptor in noncyclic transport is $\underline{A}$ located towards $\underline{B}$ donates its electrons to $\underline{C}$, respectively are

A. Pheophytin, outside of membrane Q_A

B. A_0 innerside of membrane , $NADP^+$

C. Pheophytin , innerside of membrane, PC

D. A_0 innerside of membrane , PC

Answer: A

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128. Protons & electrons acceptors (H_2 acceptors) in the Z , scheme are

A. Cytochromes, PC

B. PQ, $NADP^+$

C. Pheophytin ,

D. H_2O

Answer: B

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129. Refer to the given reaction .

$2H_2O \rightarrow 4H^+ + O_2 + 4e^-$

Where does this reaction take place in the chloroplasts of plants ?

A. Outer surface of thylakoid membrane

B. Inner surface of thylakoid membrane

C. In the matrix (stroma)

D. Intermembrane space

Answer: B

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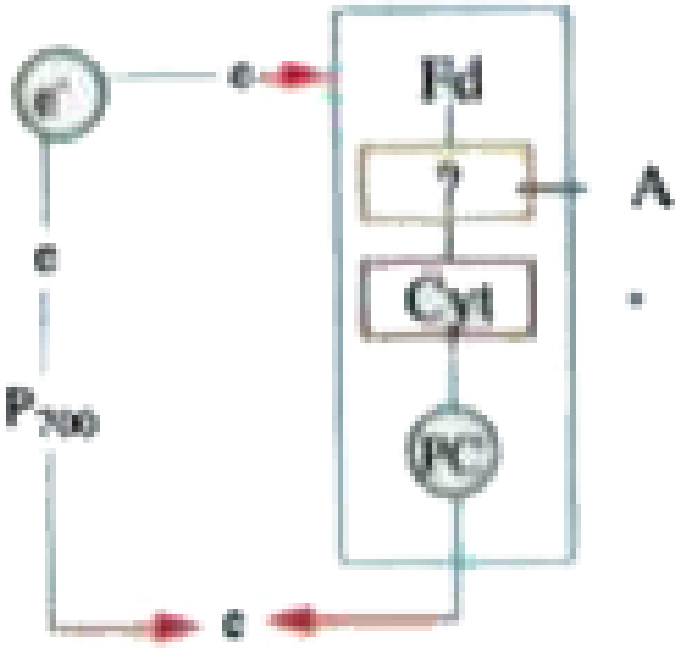
130. Identify A in the given figure and choose a correct option



A. PC

B. FRS

C. PQ

D. Cyt - b6

Answer: D

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131. Red drop is due to

A. Decline in quantum yield in separate beams of red light

B. Non functioning of PS II in free red light

C. Inhibiting effect of Red light on PS I

D. Oxidation of chlorophyll

Answer: B

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132. 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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133. Consider the following event in the photochemical conversion of light energy into chemical conversion of light energy into chemical energy by chlorophyll during photosynthesis

I) Energy transformation (light energy $\rightarrow ATP$)

II) Absorption of quantum of energy

III)Ejection of electron from P_{680}

IV) Transfer of light energy (resource transfer)

A. IV, II, I , II

B. I , III , IV, II

C. II, IV , III , I

D. II , I, IV, III

Answer: C

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134. ATP responsible for fixing CO_2 and synthesis of sugar , is produced in the

A. Lumen of thylakoid

B. Inside the thylakoid membrane

C. stroma of chloroplast

D. Cytosol of cell

Answer: C

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135. Chemiosmotic theory of ATP synthesis in chloroplasts & mitochondria is based on

A. membrane potential

B. proton gradient

C. accumulate of Na^+

D. accumulation of K^+

Answer: B

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136. ATP synthesis is linked to

A. Development of water potential gradient across the membrane.

B. Development of H.. gradient across the membrane

C. Reduction of PS I by $NADP^+$

D. Oxidation of PS II by H_2O

Answer: B

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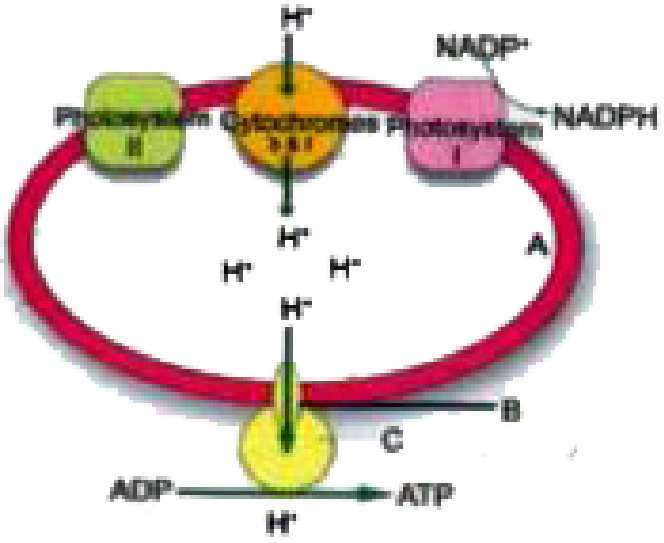
137. Identify the parts marked as A, B and C in the given figure showing ATP synthesis through chemiosmosis



A. A B C
(1) Thylakoid lumen F_0 F_1

B. $\begin{matrix} A & B & C \\ (1)\text{Thylakoid lumen} & F_1 & F_0 \end{matrix}$

C. $\begin{matrix} A & B & C \\ (1)\text{Chloroplast lumen} & F_0 & F_1 \end{matrix}$

D. $\begin{matrix} A & B & C \\ (1)\text{Chloroplast lumen} & F_1 & F_0 \end{matrix}$

Answer: A

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138. Movement of H^+ from lumen to stroma through the F_0 portion of ATPase is

A. According to concentration gradient

B. By simple diffusion

C. By active transport

D. Against conc . gradient

Answer: A

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139. Chemiosmosis requires

I) A membrane II) A proton pump

III) P roton gradient IV) ATPase

A. I and IV only

B. I, II, and III only

C. I, III and IV only

D. I, II and IV .

Answer: D

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140. According to the chemiosmotic hypothesis, the photosynthetic ATP formation occurs during the movement of protons from

A. Thylakoid lumen into the stroma through. $F_0 - F_1$ complex (ATP synthase complex)

B. stroma into the thylakoid lumen

C. Intermembrane space to mitochondrial matrix through $F_0 - F_1$ complex

D. Both (1) & (3)

Answer: A

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141. Proton pump is a movement of protons from

A. Lumen to stroma

B. stroma to Lumen

C. stroma to Cytoplasm

D. Grana to stroma

Answer: B

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142. Number of the protons required to synthesised one ATP during chemiosmosis

A. 2

B. 4

C. 6

D. 9

Answer: A

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143. Photophosphorylation in chloroplast is most similar to which of the following mitochondrial reactions ?

A. Oxidative phosphorylation

B. Substrate level phosphorylation

C. Oxidative decarboxylation

D. Hydrolysis

Answer: A

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144. Chemiosmotic theory of ATP synthesis in chloroplast & mitochondria is proposed by

A. Mitchell

B. Arnon

C. Emerson

D. Hill

Answer: A

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145. During ATP synthesis , electrons pass through

A. CO_2

B. O_2

C. H_2O

D. Cytochromes

Answer: D

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146. Chemiosmosis requires

A. Membrane

B. Proton pump

C. Proton gradient

D. All the above

Answer: D

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147. Dark reaction in Photosynthesis is called so because

A. it can occur in dark also

B. it does not directly depend on light energy

C. it cannot occur during day light

D. it occurs more rapidly at night

Answer: B

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148. PEP is primary C_2 acceptor in

A. C_4 Plants

B. C_3 Plants

C. C_2 Plants

D. both C_3 and C_4 plants

Answer: A

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149. The enzyme that is not found in a C_3 plant is

A. RuBP Carboxylase

B. PEP Carboxylase

C. NADP reductase

D. ATP synthase

Answer: B

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150. The reaction that is responsible for the primary fixation of CO_2 is catalysed by

A. RuBP Carboxylase

B. PEP Carboxylase

C. RuBP Carboxylase and PEP Carboxylase

D. PGA synthase

Answer: C

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151. When CO_2 is added to PEP, the first stable product synthesized is

A. pyruvate

B. glyceraldehdes - 3 - phosphate

C. phosphoglycerate

D. oxaloacetate

Answer: D

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152. For every CO_2 molecule entering into the Calvin cycle, the number of molecules of ATP Calvin cycle, the number of molecules of ATP and of NADPH required , respectively are

A. 3 and 3

B. 2 and 3

C. 6 and 4

D. 3 and 2

Answer: D

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153. The turns of Calvin cycle requires to form one glucose molecule

A. 1

B. 2

C. 3

D. 6

Answer: D

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154. RuBP is

A. First stable compound PCR cycle

B. Substrate for reduction phase

C. Last compound of carboxylation phase

D. Primary CO_2 acceptor of RPP cycle

Answer: D

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155. This is the most abundant enzyme in the mesophyll

A. Hexokinase

B. RUBISCO

C. Fructose 6 phosphatase

D. Sedoheptulose 7 phosphatase

Answer: B

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156. Conversion of PGA to G - 3 - P in PCR cycle involves

A. Oxidative decarboxylation

B. Decarboxylation and deamination

C. Phoshorylation and reduction

D. Reduction and transamination

Answer: C

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157. During dark reaction of photosynthesis

A. 6 - c sugar is broken down into 3 - c sugar

B. Photolysis of water occurs

C. CO_2 is reduced to organic compounds

D. $NADP^+$ is reduced

Answer: C

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158. Name the enzyme which changes its characteristics with change in concentration of O_2

A. PEP - Carboxylase

B. Hexokinase

C. Rubis - co

D. Pyruvic dehydrogenase

Answer: C

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159. When $12CO_2$ molecueles are utilized in C_2 cycle, number of troise phosphates exported out from the chloroplast into the cytosol for the synthesis of hexose will be

A. 2

B. 4

C. 6

D. 12

Answer: B

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160. Number of water molecule (s) required for each CO_2 during carboxylation reaction in C_3 cycle is

A. 6

B. zero

C. 12

D. 1

Answer: D

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161. In Calvin cycle 1.3 - Bisphosphoglyceric acid is reductive dephosphorylated to form

A. 3 - PGA

B. G - 3 - P

C. PEP

D. RuBP

Answer: B

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162. Both G - 3 and DHAP are

A. Trioses

B. 3 - compounds

C. Isomers

D. All

Answer: D

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163. Number of G - 3 - P and DHAP molecules required to regenerate 6 molecules of RuBP in Calvin cycle respectively are

A. 4,6

B. 6,4

C. 6,6

D. 4,4

Answer: B

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164. Common product formed due to the activity of transketolase enzyme during C_3 cycle

A. Ribulose - 5 - phosphate

B. Ribose - 5 - phosphate

C. Xylulose - 5 - phosphate

D. Fructose - 5 - phosphate

Answer: C

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165. Assimilatory power required to produce one molecule of glucose through C_3 cycle in C_3 plants is

A. 6 ATP & 9 NADPH

B. 30 ATP & 18 NADPH

C. 18 NADPH & 12 ATP

D. 18 ATP & 12 NADPH

Answer: D

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

A. RuBP carboxylase and PER carboxylase

B. RuBP carboxylase and PER carboxylase

C. REP carboxylase and RuBP carboxylase

D. REP carboxylase and RuBP carboxylase

Answer: A

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167. In Calvin cycle , G - 3 - P reacts with

A. DHAP , E - 4, P , X - 5 - P

B. DHAP, Fructose , 1, 6 Bisphosphate , Ribose - 5 - Phosphate

C. CO_2 RuBP , DHAP

D. DHAP , Fructose - 6 - phosphate , Sedoheptulose - 7 - Phosphate

Answer: D

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168. Synthesis of sugars in all photosynthetic plants takes place by

A. CO_2 fixation with PEP case

B. Calvin cycle reaction

C. Hatch and Slack reactions

D. Both C_3 and C_4 cycle reactions

Answer: B

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169. Primary acceptor of CO_2 in C_3 cycle is

A. 3 - carbon - ketose sugar

B. 3 - carbon - aldose sugar

C. 5 - carbon - aldose sugar

D. 3 - carbon - ketose sugar

Answer: D

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170. To produce 4 sucrose molecules the number of ATP and $NADPH + H^+$ required in C_3 plants is

A. 144 & 96

B. 120 & 48

C. 188, 192

D. 72,46

Answer: A

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171. When 54 molecules of CO_2 fixed by $RuBisCO$ in a C_3 plant , number of $G_3 - P$ participate in regeneration phase respectively

A. 90,18

B. 54,54

C. 60 , 48

D. 18, 90

Answer: D

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172. The number of ATP required in mosophyll cells of C_3 plants and bundle sheath cells of C_4 plants respectively for net export of 12 G - 3 -P

during dark reaction

A. 108 and 180

B. 18 and 30

C. 18 and 18

D. 108 and 108

Answer: D

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173. If 8 molecules of Ribulose 1, 5 - bisphosphate molecules are oxygenated by RUBISCO, how many PGA molecules are ultimately available to PCR molecules are ultimately available to PCR cycle in photosynthetic carbon oxidation cycle ?

A. 24

B. 8

C. 12

D. 16

Answer: C

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174. The immediate product of carboxylation in C_3 plants

A. RuBP

B. PGA

C. OAA

D. GAP

Answer: B

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175. Which of the following isomeric reaction occurs in regeneration phase

I) Ribose 5 -phosphate $\rightarrow$ Ribulose 5 - phosphate

II) Xylulose 5 - phosphate $\rightarrow$ Ribose 5 phosphate

III) GAP $\rightarrow$ DHAP

IV) DHAP $\rightarrow$ GAP

IV) DHAP rarr GAP

A. I & III

B. II & III

C. III & IV

D. II & IV

Answer: A::B

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176. The four carbon compound formed during the regeneration of RUBP in Calvin cycle

A. Sedoheptulose phosphate

B. Xylulose phosphate

C. Erythrose phosphate

D. Ribose phosphate

Answer: C

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177. The over all reaction of the Calvin cycle is

A.

$$3RUBR + 3CO_2 + 9ATP + 6NADPH + H^+ \rightarrow 3PGA + 9ADP$$

B.

$$3RUBR + 3CO_2 + 6ATP + 6NADPH + H^+ \rightarrow 3PGA + 6ADP$$

C.

$$3RUBR + 3CO_2 + 9ATP + 6NADPH + H^+ \rightarrow 6G - 3P + 9AD$$

D.

$$3RUBR + 3CO_2 + 6ATP + 6NADPH + H^+ \rightarrow 6G - 3P + 6AD$$

Answer: C

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178. Number of troise molecules from G - 3P pool that enter into cytosol from chloroplast to form the main end product of C_3 cycle which is transported through phloem.

A. 2

B. 10

C. 4

D. 6

Answer: C

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179. During Calvin cycle , the first step in the regeneration of CO_2 acceptor is

A. Reduction

B. Condensation

C. Dephosphorylation

D. Isomerisation

Answer: D

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180. Biochemical phase in photosynthesis was discovered for the first time by using C^{14}

A. Calvin

B. Blackman

C. Hill

D. Arnon

Answer: A

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181. For formation of 1 glucose molecule , number of Calvin cycle occur are

A. 8 times

B. 6 times

C. 4 times

D. 2 times

Answer: B

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182. In an experiment that carbon dioxide available to a C_3 plant was labelled with a radioactive isotope and the amount of radioactivity in the chloroplast was measured . As photosynthesis proceeded , in which of the following molecules did the radioactivity first appear ?

A. PGAL

B. PEP

C. PGA

D. RuBP

Answer: C

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183. How many XMP are formed in calvin cycle for the production of one glucose molecule

A. 2

B. 3

C. 4

D. 6

Answer: C

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184. How many non sugars are present as a intermediate of in calvin cycle ?

A. 2

B. 3

C. 5

D. 6

Answer: A

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185. The enzymes for thet condensation of trioses during Calvin cycle is

A. Hexokinases

B. Carboxydismutase

C. Aldolase

D. Oxysome

Answer: C

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186. Which of the following is essential to be regenerated to complete the Calvin Cycle

A. PGA

B. RUBP

C. PEP

D. OAA

Answer: B

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187. Enzyme with dual nature is

A. Hexokinase

B. RuBisCO

C. RuBP

D. Pyruvic carboxylase

Answer: B

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188. Calvin cycle operates in one type of chloroplasts, whereas Hatch - Slack pathway occurs in

A. Mitochondria

B. Golgi bodies

C. One type of Chloroplasts

D. Two type of Chloroplasts

Answer: D

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189. The source of hydrogen for carbon assimilation is

A. NADPH

B. $FADH_2$

C. RuBP

D. CO_2

Answer: A

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190. How many molecules of inorganic phosphate are released in Calvin cycle in formation of one glucose ?

A. 12

B. 16

C. 17

D. 18

Answer: B

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191. Dark reaction of photosynthesis is called so because

A. It can also occur in dark

B. Cannot occur during day

C. Occurs more rapidly at night

D. It does not require light

Answer: D

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192. How many Calvin cycles are required to produce 5 molecules of glucose ?

A. 60

B. 15

C. 30

D. 90

Answer: C

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193. The type of compounds not formed in C_3 plants is

A. 2C compound

B. 5C compound

C. 3C compound

D. 4C compound

Answer: A

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194. Site of PGA formation in C_3 plants & C_4 plants respectively

A. Mesophyll cells & Mesophyll cells

B. Bundle sheath cells & Mesophyll cells

C. Mesophyllcells & Bundles sheath cells

D. Guardcells & Mesophyll cells

Answer: C

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195. Aldolase cateysing steps in regeneration phase of calvin cycle are

A) $2G3P + 2DHAP \rightarrow 2F16P$

B) $F6P + G3P \rightarrow XMP$

C) $SMP + G3P \rightarrow XMP + RiMP$

D) $EMP + DHAP \rightarrow SHBP$

A. All the above

B. AB only

C. BC only

D. AD only

Answer: D

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196. For every calvin cycle

A. One CO_2 molecule is fixed

B. 2PGA molecules are formed

C. 3 ATP & 2NADPH are utilised

D. All the above

Answer: D

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197. .....phase in crucial in Calvin cycle for uninterrupted and continuous cycle .

A. Carboxylation phase

B. Reduction phase

C. Regeneration phase

D. All the above

Answer: C

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198. C_4 plants among the following are

A. Maize

B. Sugarcane

C. Opuntia

D. 1 & 2

Answer: D

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199. C_3 plants among the following are

A. Chlorella

B. Tomato

C. Bell pepper

D. All

Answer: D

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200. To produce 4 sucrose molecules the number of ATP and $NADPH + H^+$ required in C_3 plants is

A. 144 & 96

B. 120 & 48

C. 188, 192

D. 72, 46

Answer: A

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201. Identify the incorrect one

A. In all plants light phase takes in similar way

B. During dark phase CO_2 assimilation takes place in two ways

C. In all plants PGA is first stable product

D. Dark phase is indirectly dependent on light

Answer: C

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202. How much assimilatory power is required to form one glucose in a C_3 plant

A. 18 ATP - 12NADPH $+H^+$

B. 30 ATP - 12NADPH $+H^+$

C. 24 ATP - 18NADPH $+H^+$

D. 30 ATP - 18NADPH $+H^+$

Answer: A

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203. If $36CO_2$ molecules are fixed in C_3 plant what will be :

A. The number of G - 3P and

B. Erythrose - 4- Phosphate formed during the dark reaction

C. a = 144 , b =24

D. a = 72, b = 12

Answer: D

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204. Given table shows the $^{14}CO_2$ in which molecule would the radioactively appear first in these plants ?

A.

Wheat	Sugarcane
3 - Phosphoglycerate	Oxaloacetate

B.

Wheat	Sugarcane
3 - Phosphoglycerate	3 - Phosphoglycerate

C.

Wheat	Sugarcane
Oxaloacetate	Oxaloacetate

D.

Wheat	Sugarcane
Malate	3 - Phosphoglycerate

Answer: A

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205. During Hatch - Slack pathway of CO_2 reduction , C_4 - acids are broken down to release CO_2 and a - 3 carbon molecule in

A. Mesophyll chloroplast

B. Bundle sheath chloroplast

C. Bundle sheath cytosol

D. Mesophyll cytosol

Answer: B

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206. Kranz' anatomy is found in

A. Sugar cane

B. Maize

C. Sorghum

D. All the above

Answer: D

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207. Acceptor of CO_2 in C_4 and C_3 plants respectively

A. PEP case and RUBISCO

B. OAA and PGA

C. PEP and RUBP

D. PGAL and malic acid

Answer: C

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208. In C_4 plants , CO_2 is first fixed in

A. Bundle sheath

B. Mesophyll

C. Guard cells

D. All epidermal cells

Answer: B

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209. Which of the following feature is associated with C_4 plant

A. High photorespiration

B. All green cells posses calvin cycle enzymes

C. Ability to tolerate high temperature

D. O.A.A. is the initial product of CO_2 fixation in bundle sheath cells

Answer: C

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210. The term 'kranz' anatomy refers to

A. Presence of large size chloroplasts in bundle sheath cells

B. Presence of thick walls in bundle sheath cells

C. Appearance of wreath of cells surrounding the vascular bundles in C_4 leaf

D. Presence of three type of cells in leaves (palisade, spongy and bundle sheath) in C_4 leaf

Answer: C

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211. The first step of CO_2 fixation in Hatch and Slack's pathway in plants is

A. Formation of O.A.A by carboxylation of PEP in bundle sheath cells

B. Formation of O.A.A by the carboxylation of RUBP in mesophyll cells

C. Formation of PGA in mesophyll cells

D. Formation of O.A.A by carboxylation of PEP in mesophyll cells.

Answer: D

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212. In C_4plants bundle sheath shows

A. Large inter cellular spaces and thick walled cells

B. Large inter cellular spaces and thin walled cells

C. Thick walled cells having many chloroplasts and no inter cellular spaces

D. Thin walled cells with granal chloroplasts

Answer: C

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213. C_4 plants have higher net photosysnthetic rate because

A. They have no photorespiration

B. They have PEP as CO_2 acceptor

C. They can photosynthesize in low light intensity

D. They have kranz type of anatomy

Answer: A

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214. In leaves of C_4 plants sugars are synthesized in

A. Stroma of chloroplast of mesophyll cells

B. Grana of chloroplast of mesophyll cells

C. Sieve tube elements of phloem

D. Bundle sheath cells

Answer: D

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215. In C_4 pathway regeneration of PEP occurs in

A. Epidermal cells of leaves

B. Cytososl of bundle sheath cells

C. Chloroplast of mesophyll cells

D. Chloroplast of bundle sheath cells .

Answer: C

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216. Which of the following statement is not a special featureC_4 plants

A. They have special type of leaf anatomy

B. They tolerate higher temperature

C. They show photorespiration

D. They show response to high ligh intensity

Answer: C

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217. The form of carbon used for the carboxylation of phosphoenolpyruvate in C_4 plants is

A. CH_4

B. HCO_3^-

C. H_2CO_3

D. C_2H_4

Answer: B

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218. The net requirement of assimilatory power for the formation of 6 hexose molecules in maize plant is

A. 72ATP , 48NADPH

B. 90ATP , 60NADPH

C. 108ATP , 72NADPH

D. 180ATP , 72NADPH

Answer: D

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219. What is the ratio of ATP requirement for the fixation of 6 molecules of CO_2 in sugarcane and 5 molecules of N_2 in bean ?

A. $5:16$

B. $3:16$

C. $5:8$

D. $3:8$

Answer: B

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220. What type of reaction occurs when Malic acid is converted into Pyruvic acid in the bundle sheath cells of C_4 plants

A. Decarboxylation

B. Dehydrogenation

C. Oxidative decarboxylation

D. Transamination

Answer: C

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221. C_4 cycle was first discovered in

A. Saccharum

B. Sorghum

C. Maize

D. Finger millet

Answer: A

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222. Referthe given reaction

$RuBP + O_2 \xrightarrow[\text{Oxygenase}]{\text{RuBP}}$ Phosphoglyceric acid + Phosphoglycolic and

In is the first reaction of

A. C_3 path way

B. C_4 pathway

C. C_5 pathway

D. Glycolysis

Answer: A

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223. Which of the following statement is not correct with reference of C_4 plants

A. Kranz anatomy

B. Dimorphic nature of Chloroplasts

C. Agranal chloroplasts in bundlesheath cells

D. Chloroplasts of mesophyll cells store starch

Answer: D

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224. C_4 plants are different from C_3 plants with reference to

A. The substrate that accepts CO_2 in carbon assimilation

B. Type of end products of photosynthesis

C. Number of ATP consumed in the synthesis of sugar

D. The type of pigments involved in Photosynthesis

Answer: A

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225. Dicarboxylic acids pathway is seen in

A. Leaves of Dolichos

B. Roots of Maize

C. Stems of Opuntia

D. Leaves of Saccharum

Answer: D

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226. In which cells of leaf, pyruvate is converted to PEP in C_4 pathway ?

A. Epidermal cells

B. Mesophyll cells

C. Bundle sheath cells

D. Guard cells

Answer: B

Watch Video Solution

227. Choose wrong combination with respect to the location of enzymes in C_4 plants

A. PEPcase - stroma of mesophyll cell chloroplast

B. RUBISCO - stroma of bundle sheath cell chloroplast

C. Malic enzyme - strone of bundle sheath cell chloroplast

D. Pyruvate dikinase - stroma of mesophyll cell chloroplast

Answer: A

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228. The following is not relate to C_4 plant

A. Water use efficiency is more

B. Photorespiration is not detectable

C. CO_2 compensation points is high

D. The primary acceptor of CO_2 is a 3C compound

Answer: C

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229. Agranal chloroplast occur is

A. Succulents

B. C_4 plants

C. Hydrophytes

D. C_3 plants

Answer: B

Watch Video Solution

230. In C_4 plants CO_2 reduction occurs in

A. palisade tissue

B. spongy parenchyma

C. Bundle sheath cells

D. Guard cells

Answer: C

Watch Video Solution

231. In C_4 cycle first CO_2 acceptor is

A. 3C compound

B. 4C compound

C. 5C compound

D. 6C compound

Answer: A

Watch Video Solution

232. In an experiment that carbondioxide available to a C_4 plant was labelled with a radioactive isotope and the amount of radioactivity in the chloroplast was measured . As photosynthesis proceeded , in which of the following molecules did the radioactivity first appear

A. Oxaloacetic and

B. PEP

C. Malic acid

D. RuBP

Answer: A

Watch Video Solution

233. PEP carboxylase is associated with

A. CAM plants

B. C_3 plants

C. C_4 plants

D. (1) & (3)

Answer: D

Watch Video Solution

234. which pair is wrong ?

A. C_3 - Maize

B. C_4 - Kranz anatomy

C. Calvin cycle - PGA

D. Hatch & Slack cycle - OAA

Answer: A

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235. Choose the correct statement for the fixation of one CO_2 molecule

A. 3ATP & 2 NADPH are required through calvin cycle

B. 5 ATP & 2 NADPH are required through Hatch & slack cycle

C. Photochemical reactions are involved in photolysis of water & phosphorylation of ADP into ATP

D. all of the above

Answer: D

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236. Number of carboxylation in C_4 cycle is

A. four

B. three

C. two

D. one

Answer: C

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237. In case of C_4 - plants , which enzyme fixes the CO_2 released during decarboxylation of malate

A. RuBisCO

B. MDH

C. PEPase

D. None of these

Answer: A

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238. In the C_4 - plants , C_4 cycle occurs in the mesophyll cells and C_3 - cycle occurs in bundle sheath cells, whereas in CAM plants .

A. C_4 and C_3 - cycles occur in the mesophyll cells only

B. C_4 - cycle occurs in bundle sheath cells and C_3 - cycle in mesophyll cells

C. C_4 - cycle very rarely

D. C_4 and C_3 - cycles occur in bundle sheath cells

Answer: A

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239. Which of the following plants is not C_4 - plant ?

A. Saccharum munja

B. Triticum vulgare

C. Zea mays

D. Euphorbia splendens

Answer: D

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240. C_4 plants are found among

A. Dicots only

B. Monocots only

C. Both (1) and (2)

D. In family - Poaceae (Gramineae) only

Answer: C

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241. Which of the following plants is a better photosynthesiser ?

A. Mango

B. Sugacane

C. Wheat

D. Rice

Answer: B

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242. 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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243. In which cells of leaf, pyruvate is converted to PEP in C_4 pathway ?

A. Epidermal cells

B. Mesophyll cells

C. Bundle sheath cells

D. Guard cells

Answer: B

Watch Video Solution

244. Which of the following is a 4 - carbon compound ?

A. Oxaloacetic acid

B. Phosphoglyceric acid

C. Ribulose bisphosphate

D. Phosphoenol pyruvate

Answer: A

Watch Video Solution

245. Which of the following is wrongly matched

A. Sorghum - Kranz anatomy

B. PEP carboxylase - Mesophyll cells

C. Blackman - Law of minimum

D. Photosystem II - P_{700}

Answer: C

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246. CAM plants among the following are

A. Opuntia

B. Pineapple

C. Bryophyllum

D. All the above

Answer: D

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247. CAM helps the plants in

A. secondary growth

B. diseases resistance

C. reproduction

D. conserving water

Answer: D

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248. In which of the following CO_2 fixation and Calvin cycle are separated in time

A. C_4 plants

B. C_3 plants

C. CAM plants

D. All the above

Answer: C

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249. In CAM pathway the first dicarboxylic acid is formed as resultant of

A. Night CO_2 fixation

B. Decarboxylation of malic acid

C. Second CO_2 fixation

D. Phosphorylation of pyruvic acid

Answer: A

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250. During day time , CAM plants procure carbon dioxide for photosynthesis from

A. Pyruvic Acid

B. Oxaloacetic Acid

C. Oxalic Acid

D. Malic Acid

Answer: D

Watch Video Solution

251. The number of ATP required in excess to assimilate atmospheric CO_2 to four molecules of triose phosphates in C_2 plants as compared to C_3 plants is

A. 60

B. 24

C. 30

D. 12

Answer: B

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252. Which of the following kinds of plant fixes carbon dioxide by way of crassulacean acid metabolism (CAM)

A. Oak tree

B. Cactus

C. Grass

D. Red alga

Answer: B

Watch Video Solution

253. In CAM plants, organic acids are decarboxylated at

A. Day

B. Night

C. Both (1) & (2)

D. None of these

Answer: A

Watch Video Solution

254. Which of the following equation holds true for acidification reactions of CAM pathway ?

A. $PEP + CO_2 + H_2O \xrightarrow{\text{PEPcase}} \text{OAA} + H_3PO_4$

B. $\text{OAA} + NADH \xrightarrow{\text{Dehydrogenase}}$ Malic acid $+ NAD^+$

C. Malic acid $+ NADP^+ \xrightarrow[\text{enzyme}]{\text{Malic}}$ Pyruvic + CO + NADPH

D. Both (1) and (2)

Answer: D

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255. The organic acid concentration in CAM plants

A. Decreases during day

B. Increases at night

C. Both (1) and (2)

D. Remains same always

Answer: C

Watch Video Solution

256. Sunken stomata are usually found in

A. C_3 plants

B. CAM plants

C. Insectivorous

D. Phanerogams

Answer: B

Watch Video Solution

257. CAM pathway is observed in

A. Pineapple

B. Maize

C. Sunflower

D. Sugarcane

Answer: A

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258. In CAM - plants , carbon dioxide required for photosysnthesis enters the plant body during

A. Day time through the lenticels

B. Night through the stomata, which are kept open

C. Day time when the stomata are open

D. Night when the hydathodes are open

Answer: B

Watch Video Solution

259. During day time , CAM plants procure carbon dioxide for photosynthesis from

A. Pyruvic Acid

B. Oxaloacetic Acid

C. Oxalic Acid

D. Malic Acid

Answer: D

Watch Video Solution

260. During photorespiration RuBisCO acts as

A. Oxygenase

B. Carboxylase

C. Transaminase

D. Reductase

Answer: A

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261. Which of the following statements are true for photorespiration ?

A. No synthesis of ATP

B. No synthesis of NADPH

C. Release of CO_2

D. All the above

Answer: D

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262. Inhibition of photosynthesis due to photorespiration of a type of

A. Competitive inhibition

B. Non - competitive inhibition

C. Uncompetitive inhibition

D. Feed back inhibition

Answer: A

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263. The unique uneconomical process which is mediated by RuBisCO is

A. Respiration

B. Photorespiration

C. Photosynthesis

D. Transpiration

Answer: B

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264. The substrate of photorespiration is formed in

A. Peroxisome

B. Mitochondrion

C. Chloroplast

D. Glyoxysome

Answer: C

Watch Video Solution

265. In which type of reactions related to plant photosynthesis peroxisomes are involved ?

A. Glycolate cycle

B. Calvin cycle

C. Bacterial photosynthesis

D. Glyoxylate cycle

Answer: A

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266. The enzymes acting as both carboxylase at one time & oxygenase at another time

A. PEP carboxylase

B. RUBISCO

C. Carbonic anhydrase

D. ATP ase

Answer: B

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267. The following compounds are intermediates in the pathway of photorespiration

I) Phosphoglycolate II) Serine

III) glyoxylate IV) glycine

The correct sequence of their appearance in the pathway is

A. I,II, III, IV

B. I,III, IV,II

C. II,I,III,IV

D. II,I,IV,III

Answer: B

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268. Inhibition photosynthesis in high concentration of oxygen is mainly due to

A. distribution of RuBP carboxylase

B. inactivation of RuBP carboxylase

C. non- synthesis of RubP carboxylase

D. RuBP carboxylase acting as oxygenase

Answer: B

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269. The substrate of photorespiration is

A. Malic acid

B. Oxaloacetic Acid

C. Glycolic acid

D. PGA

Answer: C

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270. During photorespiration , the oxygen consuming reaction occur in

A. Stroma of chloroplasts and mitochondria

B. Stroma of chloroplasts and peroxisomes

C. Grana of chloroplasts and peroxisomes

D. Stroma of chloroplasts

Answer: B

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271. How many molecules of glycine are required torelease one molecule of CO_2 in photorespiration ?

A. One

B. Two

C. Three

D. Four

Answer: B

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272. Glycolate accumulates in chloroplasts, when there is

A. High CO_2

B. Bright light

C. Low temperature

D. Low CO_2

Answer: B

Watch Video Solution

273. Organelles associated with photorespiration are

A. Chloroplast, mitochondria , Peroxisome

B. Chloroplast mitochondria , lysosome

C. Mitochondria , peroxisome , centrosome

D. Nucleus , centrosome peroxisome

Answer: A

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274. Which of the following is formed during photorespiration ?

A. Sugar cane

B. Phosphoglycolate

C. NADPH

D. ATP

Answer: B

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275. The ratio between the number of 2 - carbon and 3 - carbon intermediates having $-NH_2$ group formed in photosynthetic oxidation cycle is

A. $1:1$

B. $2:1$

C. $3:2$

D. $3:4$

Answer: B

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276. The rate of photosysnthesis is determined by the factor available at

A. very low

B. optimum

C. sub optimum

D. maximum

Answer: C

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277. Black man's law of limiting factor is applicable to

A. only photosynthesis

B. only respiration

C. only physical process

D. any biochemical process

Answer: D

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278. Light is rarely a limiting factor for photosynthesis in all the following plants but is oftenly a limiting factor in

A. Sciophytes

B. Heliophytes

C. Normal C_3 plants

D. Normal C_4 plants

Answer: A

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279. The major limiting factor for photosynthesis is

A. O_2

B. Light

C. CO_2

D. water

Answer: C

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280. Tomato and bell pepper are

A. C_3 and C_4 plants respectively

B. C_4 and C_3 plants respectively

C. C_3 plants

D. C_4 plants

Answer: C

Watch Video Solution

281. The external photosynthetic factor that influences the process more through plant rather directly on photosynthesis is

A. CO_2

B. Water

C. Light

D. Temperature

Answer: B

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282. In normal plants light saturation occurs at

A. 10% of full sunlight

B. 50% of full sunlight

C. double to full sunlight

D. four time to full sunlight

Answer: A

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283. Photosynthesis

A. Affected by the simultaneous interaction of several factors

B. Its rate determined by the factor available at optimum level

C. Influenced more by the the external factor than internal factors

D. At one particular time more than one factors functions as limiting factor

Answer: A

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284. In C_3 and C_4 plants , the CO_2 saturation respectively is

A. At about $360\mu 1L^{-1}$ beyond $450\mu 1L^{-1}$

B. Less than $360\mu 1L^{-1}$, less than $450\mu 1L^{-1}$

C. More than $360\mu 1L^{-1}$, less than $450\mu 1L^{-1}$

D. Beyond $450\mu 1L^{-1}$, at about $360\mu 1L^{-1}$

Answer: D

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285. Quality of light refers to

A. intensity of light

B. frequency of light

C. wavelength of light

D. duration of light

Answer: C

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286. A point at which illuminated plant parts stop absorbing CO_2 from their environment , is known is

A. CO_2 compensation point

B. CO_2 saturation point

C. CO_2 optimum point

D. CO_2 limiting point

Answer: A

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287. Excessive elongation of plants and poor development of leaves when they were grown in darkness is called

A. Foolish seedling disease

B. Bolting

C. Embolism

D. Etiolation

Answer: D

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288. Which of the following influences feed back inhibition of Photosynthesis

A. Chlorophyll degration

B. Hight lightintensity

C. Low CO_2 concentration

D. Carbohydrate accumulation

Answer: D

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289. Law of minimum was proposed by

A. Warburg

B. F.F. Blackman

C. Liebig

D. Emerson

Answer: C

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290. Warburg effect is

A. The enhancement effect of light on Photosynthesis

B. The feed back inhibition in Photosynthesis

C. The inhibitory effect of high CO_2 on Photosysnthesis

D. The inhibitory effect of high O_2 on Photosynthesis

Answer: D

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291. Warburg effect has not been observed in

A. Maize

B. Sugarcane

C. Sorghum

D. All of these

Answer: D

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292. Which of the following colours of light work(s) best for photosynthesis ?

A. Green

B. Yellow

C. Blue and red

D. violet and yellow

Answer: C

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293. For the process of photosynthesis, which one of the following is not essential ?

A. Light and chlorophyll

B. CO_2 and light

C. Oxygen and glucose

D. Water and minerals

Answer: C

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294. The limiting step in photosynthesis is the rate of

A. O_2 evolution

B. light reaction

C. dark reaction

D. CO_2 diffusion to photosynthetic site

Answer: B

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295. High CO_2 compensation point is found in

A. C_3 - plants

B. C_4 - plants

C. CAM plants

D. Algae

Answer: A

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296. Dry weight of leaf is maximum during

A. Morning

B. Afternoon

C. Noon

D. Night

Answer: B

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297. Rate of photosynthesis is independent of

A. Duration of light

B. Intensity of light

C. Temperature

D. Respiration

Answer: D

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298. What will happen to the rate of photosysnthesis if rate of translocation of food is slow tha photosynthesis rate ?

A. Becomes double

B. Decreases

C. Increases

D. Remains same

Answer: B

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299. Which one of the following would not limit photosynthesis or not be a limiting factor photosynthesis ?

A. Light

B. CO_2

C. Chlorophyll

D. Oxygen

Answer: D

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300. Maximum O_2 evolution occurs from

A. Forests

B. Marine phytoplankton

C. Crops

D. Land mass

Answer: B

Watch Video Solution

301. Wavelength of light that carries out photosynthesis in bacteria is

A. Blue

B. Red

C. Ultraviolet

D. Near infra red or far red

Answer: D

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302. It is difficult for most plants to carryout photosynthesis in very hot, dry environments why ?

A. Very intense light over powers pigment molecules

B. The closing of somata keeps away CO_2 from entering and O_2 from leaving plants

C. CO_2 build up in the leaves , blocking carbon fixation

D. None of the above

Answer: B

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303. Very strong light light has a direct inhibiting effect on photosysnthesis, which is known as

A. Solarisation

B. Etiolation

C. Chlorosis

D. Defoliation

Answer: A

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

A. They consume O_2 at night

B. Produe CO_2 at night

C. They release O_2 only during day

D. They are unable to photosynthesise and deplete CO_2 of he room at night

Answer: B

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305. A reduction in the quantity of oxygen evolution during photosynthesis may be observed at

A. Light having wavelength more than 680 nm

B. Light having wavelength less than 680 nm

C. Light having wavelength 560 nm

D. Light having wavelength less than 360 nm

Answer: A

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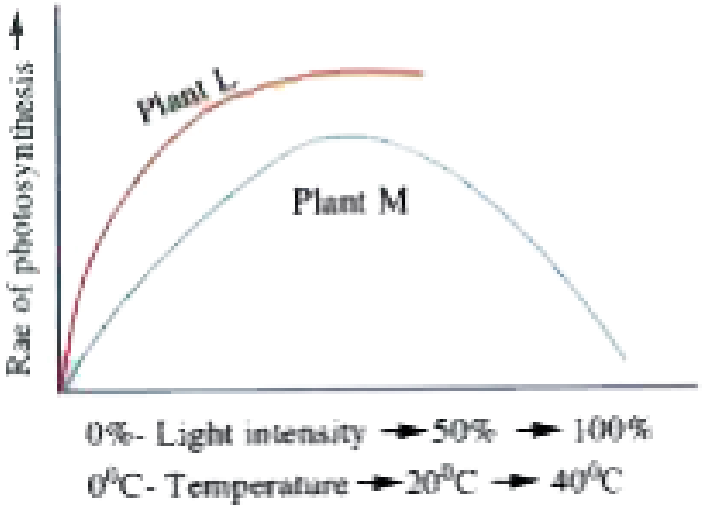
306. When two plants L and M were exposed to different light intensities and temperature , they showed changes in their rates of photosynthesis , which have been represented in the following graph.



The graph indicates that

A. Plant L is a C_3 plant for which the light saturation point is 100% of full sunlight .

B. Plant M is a C_4 plant for which the optimum temperature is around $20^\circ C$

C. Plant M is a C_3 plant which is more affected at higher temperature and higher light intensity as compared to plant L

D. Plant L is a C_4 plant and cannot function at light intensities above the saturation point

Answer: C

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Exercise Ii

1. In an experiment demonstrating the evolution of oxygen in Hydrilla , sodium bicarbonate is added to water in the experiment ste- up . What would happen if all other conditions are favourable ?

A. Amount of oxygen evolved decreases as the availability of carbondioxide increases

B. Amount of oxygen evolved increases as carbondioxide in water is absorbed by sodium bicarbonate

C. Amount of oxygen evolved decreases as carbondioxide in water is absorbed by sodium bicarbonate

D. Amount of oxygen evolved increases as the availability of carbon dioxide increase

Answer: D

Watch Video Solution

2. In which following example chlorophyll a/b ratio is minimum

A. LHC

B. ETS

C. PSI

D. PS II

Answer: D

Watch Video Solution

3. The oxygen liberated during the photosynthesis given by Engelmann using all , except

A. Filamentous green alga Cladophora

B. Unicellular green alga Chlorella

C. Supension of aerobic bacteria

D. Prism to split the light in the its components

Answer: B

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4. Read the following statements :

How many of the above statements are correct ?

A. Two

B. One

C. Four

D. Three

Answer: D

View Text Solution

5. How many components listed below are part of cyclic ETS ? P_{700}, P_{680} , NADP reductase, Hydrogen carrier, PS I, water Splitting Complex, PS II

A. Two

B. three

C. Five

D. Four

Answer: B

Watch Video Solution

6. Regeneration of four molecules of RuBP in C_3 cycle requires the expenditure of ATP.

A. 1

B. 4

C. 3

D. 2

Answer: B

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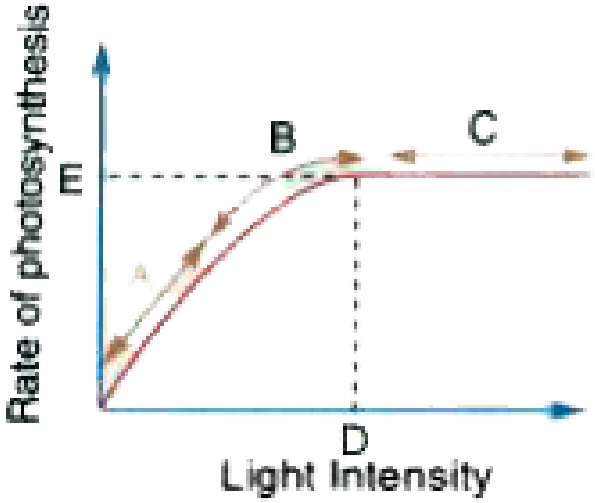
7. Choose the correct labelling for given figure



A. D- Saturation point , E - Maximum photosynthesis

B. A - Achieved at high light intensity

C. D - 10% of total sunlight , E - Compensation point

D. A Light saturation at 10% of total sunlight

Answer: A

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8. Identify the incorrect match .

A. Regeneration of PEP - Mesophyll cells

B. RuBP oxygenase activity - Chloroplast

C. Photorespiratory loss - Chytoplasm of CO_2

D. Decarboxylation in - Bundle sheath cell C_4 pathway

Answer: C

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9. Electric charge separations or quantum conversion occurs at

A. Antenna molecules

B. Thylakoid membrane

C. Reaction centre

D. Stroma

Answer: B

Watch Video Solution

10. Sorghum and sugarcane plants show saturation at about

A. 50% of full sunlight

B. 10% of full sunlight

C. 360 ppm of CO_2

D. 500 ppm of CO_2

Answer: C

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11. C_4 Plants can tolerate saline conditions due to

A. Occurrence of organic acids

B. Absence of Photorespiraition

C. Presenc rod PEP carboxylase enzyme

D. presence of PEP Carboxylase enzyme

Answer: A

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12. Electron flow in thylakoid membrane from $PS-II \rightarrow PSI$ is prevented by II rarr PSI is prevented by

A. 2,4,-D

B. Urea

C. DCMU

D. Paraquat

Answer: C

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13. Electron flow in thylakoid membrane from PSI to $NADP^+$ is Prevented by

A. 2,4,-D

B. Paraquat

C. Auxin

D. DCMU

Answer: B

Watch Video Solution

14. During Photosynthesis shuttle system operates between

A. Cytosol to chloroplast

B. Lumen of thylakoids to stroma

C. Mesophyll cells to bundle sheath cells

D. Inter cellular spaces to mesophyll cells

Answer: C

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15. Plants growing in different strata in a water body manage minimum their photosynthetic efficiency by

A. Changing source of energy (chemical)

B. Adjusting pigment composition

C. Utilising only blue region of PAR

D. Producing more number of Chlorophyll a molecules

Answer: B

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16. C_3 cycle was first studies in a plant of A group in plant kingdom & C_4 cycle was first studied in a plant of B group in plant kingdom A & B respectively are

A. Dicot , monocot

B. Algae, angiosperms

C. Monocot, dicot

D. Angiosperms, brown alga

Answer: B

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17. Choose the correct statement from the following regarding bacterial Photosynthesis

A. H_2 is the source of hydrogen

B. Dark reaction occurs in all but not light reaction

C. All produce sulphur as by product

D. All have pigment in chromatophores

Answer: B

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18. Weedicides used in the crop fields kill the weeks by

A. Preventing electron transport in respiration

B. Preventing dark phase in photosynthesis

C. Preventing light absorption by pigment

D. Preventing electron transfer in thylakoid membrane (or) in light phase

Answer: D

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19. Isolated chloroplast cannot synthesize starch through dark phase inspite of possessing stroma and dark phase enzymes It is due to absence of

A. Cytosol for exporting G3P

B. Photophosphorylation

C. Suitable Hydrogen acceptor

D. Carbondioxide for dark phase reactions

Answer: D

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20. Excited electron comes back to ground state by these process

A. Fluorescence

B. Phosphorescence

C. Energy transfer

D. Any one of the above

Answer: D

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21. One of the following gesture of electron is useful to green plants in production of assimilatory power during photochemical reactions

A. Fluorescence

B. Phosphorescence

C. Energy transfer

D. All the above

Answer: C

Watch Video Solution

22. Starch formation during dark phase is observed in these regions

A. Chloroplasts

B. Amyloplasts

C. Cytosol of mesophyll cells

D. 1 & 3

Answer: D

Watch Video Solution

23. Starch storing structure in green algae and higher plants respectively are

A. Chloroplast, chloroplast

B. Pyrenoids , amyloplast

C. Underground organs , amyloplast

D. Chloroplast , pyrenoids

Answer: B

Watch Video Solution

24. Chlorophyll ' C" differ from Chlorophyll 'a' and ' b ' in

A. Absence of Mg

B. Ability to dissolved in water

C. Absence of phytol tail

D. Absence of porphyring structure

Answer: C

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25. Pigment with four pyrrole rings in their structure are

A. Chlorophyll

B. Phycoerythrin

C. Phycocyanin

D. All the above

Answer: D

Watch Video Solution

26. Chlorophyll appears _____ When flouresed and carotene appears ____ (colour)

A. Orange , blue

B. Red green

C. Green , orange

D. Blue , red

Answer: B

Watch Video Solution

27. A give dicot family consists of several genera which are

A. Only C_3 plants

B. Only C_4 plants

C. C_3 (or) C_4 plants

D. C_3 & C_4 plants

Answer: C

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28. Leaf anatomy has bundle sheath around the Vascular bundle in

A. C_3 plants

B. C_4 plants

C. all dicot plants

D. 1 or 2

Answer: B

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29. Malic dehydrogenase enzyme is present in

A. Mitochondria

B. Chloroplast

C. Cytosol

D. 1 & 2

Answer: D

Watch Video Solution

30. In C_4 plants enzymes of PCR cycle are present in

A. Mesophyll cells

B. Bundle sheath cells

C. (1) & 2

D. None

Answer: B

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31. Common organic acids found in both Chloroplast and mitochondria in C_4 plants are

A. PGA, PA

B. OAA,MA

C. PEP,MA

D. Aspartic acid , OAA

Answer: B

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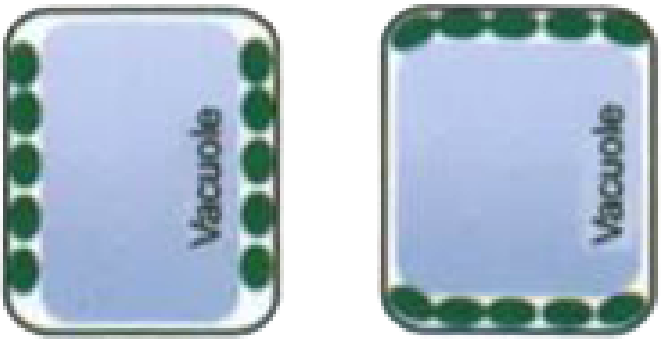
32. In the above diagram A & B represent respectively



A. Mesophyll cells in upper epidemics & lower epidermis

B. Mesophyll cells in temperature & tropical plant leaves

C. Chloroplast alignment at high & low light in tensity

D. Variation in Chloroplast number in different seasons

Answer: C

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33. Efforts to put redioisotopes to beneficial gained momentum

A. After world war I

B. Just before world war II

C. Just after world war II

D. During world war III

Answer: C

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Exercise Iii

1. Phosphoenol pyruvate (PEP) is the primary CO_2 acceptor in :

A. C_3 plants

B. C_4 plants

C. C_2 plants

D. C_3 and C_4 plants

Answer: B

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2. With reference to factors affecting the rate of Photosynthesis, which of the following statements is $\underline{\text{not}}$ correct ?

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

B. Increasing atmosphere CO_2 concentration up to 0.05% can enhance CO_2 fixation rate

C. C_3 plants respond to higher temperatures 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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3. Emerson's enhancement effect and Red drop. have been instrumental is the discovery of :

A. Photophosphorylation and non-cyclic electron transport

B. Two photosystem operating simultaneously

C. Photophosphorylation and cycling electron transport

D. Oxidative phosphorylation

Answer: B

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4. Oxygenic photosynthesis occurs in

A. Oscillatoria

B. Rhodospirillum

C. Chlorobium

D. Chromatium

Answer: A

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5. Anoxygenic photosynthesis is characteristic of

A. Rhodospirillum

B. Spirogyra

C. Chlamydomonas

D. Ulva

Answer: A

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6. Transition state structure of the substate formed during an enzymatic reaction is

A. Transient but stable

B. Permanent but unstable

C. Transient but unstable Transient but unstable

D. Permanent and stable

Answer: C

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7. An aleg which can be employed as food for human beings

A. Ulothrix

B. Chlorella

C. Spirogyra

D. Polysiphonia

Answer: B

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8. Read the following four statements (A-D) Both ,

A) Photophosphorylation and oxidative phosphorylation involve uphill transport of protons across the membrane

B) In dicot stems , a new cambium originates from cells of pericycle at the time of secondary growth

C)Statements in flowers of Glorious and Petumia are polyndrous

D) Symbiotic nitrogen-fixers occurs in free living state

How many of the above statement are right ?

A. One

B. Two

C. Three

D. Four

Answer: B

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9. Which one of the following organisms is correctly matched with its three characteristics ?

A. Maize : C_3 pathway , Closed vascular bundles , Scutellum

B. Pea : C_3 pathway , Endospermic seed, Vexillary aestivation

C. Tomato : Twisted aestivation , Axile Placentation , Berry

D. Onion : Bulb, Imbricate aestivation , Axile Placentation also in soil

Answer: A

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10. The process that makes important difference between C_3 and C_4 plants is

A. Photorespiraition

B. Transportation

C. Glycolysis

D. Photosynthesis

Answer: A

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11. Kranz anatomy is typical of .

A. C_4 - plants

B. C_3 - plants

C. C_2 - plants

D. photorespiration

Answer: A

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12. The process that makes important difference between C_3 and C_4 plants is

A. Photosynthesis

B. Photorespiraition

C. Transportation

D. Glycolysis

Answer: B

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13. The correct sequence of cell organelles during Photorespiraition is

A. Chloroplast , mitochondria , peroxisome

B. Chloroplast , vacuole , peroxisome ,

C. Chloroplast, Golgi bodies , mitochondria

D. Chloroplast , Rough endoplasmic reticulum Dictyosomes

Answer: A

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14. Of the total incident solar rediation the proportion of PAR is

A. about 60%

B. less than 50%

C. more than 80%

D. about 70%

Answer: B

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15. CAM helps the plants in

A. Conserving water

B. Secondary growth

C. Disease resistance

D. Reproduction

Answer: A

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16. In Kranz anatomy , the bundle sheath cells have

A. thick walk, many intercellular spaces and few chloroplasts.

B. thin walls, many intercellular spaces and no chloroplasts.

C. thick walls , no intercellular spaces and large number-of chloroplasts.

D. thin walls , no intercellular spaces and several chloroplasts .

Answer: C

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17. PGA as the first carbon dioxide fixation product was discovered in Photosynthesis of

A. Bryophyte

B. Gymnosperms

C. Angiosperm

D. Alga

Answer: D

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18. C_4 Plants are more efficient Photosynthesis than C_3 plants due to

A. Higher leaf area

B. Presence of large number of chloroplast in the leaf cells

C. Presence of thin cuticle

D. Lower rate of photorespiraition

Answer: D

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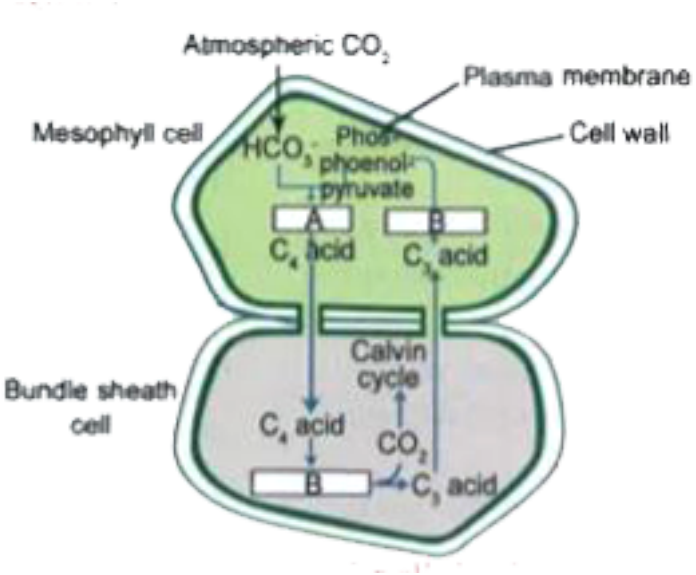
19. Study the pathway given below:



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

A. A Fixation B Transamination C Regeneration

B. A Fixation B Decarboxylation C Regeneration

C. A Carboxylation B Decarboxylation C Reduction

D. A Decarboxylation B Reduction C Regeneration

Answer: B

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20. Read the following four statements ,A,B,C and D select the right option having both correct statments.

(A) Z scheme of light reaction takes place in presence of PSI only .

(B) Only PSI is functional in cyclic photo phosphorylation

(C) Cyclic Photophosphorylation results into synthesis of ATP and $NADP_2$

(D) Stroma lamellar lack PSII as well as NADP reductase

A. A and B

B. B and C

C. C and D

D. B and D

Answer: D

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21. Oxygenic photosynthesis occurs in

A. Chromatium

B. Oscillatoria

C. Rhodospirillum

D. Chlorobium

Answer: B

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22. Stroma in the chloroplasts of higher plants contain

A. Light-indepedent reaction enzymes

B. Light-dependent reaction enzymes

C. pigments

D. Chlorophyll

Answer: A

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23. Cyclic Photophosphorylation produces

A. NADPH

B. ATP and NADPH

C. ATP, NADPH and oxygen

D. ATP

Answer: D

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24. The C_4 plants are Photosynthetically more efficient than C_3 plants because

A. The carbon dioxide compensation points is more

B. Carbon dioxide generated during Photorespiraition is trapped and recycled through PEP carboxylase

C. The carbon dioxide efflux is not Prevented

D. They have more chloroplasts

Answer: B

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25. In leaves of C_4 plants malic acid synthesis during carbon dioxide fixation , occurs in

A. epidermal cells

B. mesophyll cells,

C. bundle sheath cells

D. guard cells

Answer: B

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26. The wavelength of light absorbed by reaction centre of PS-II is

A. 640 nm

B. 680 nm

C. 720 nm

D. 940 nm

Answer: B

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27. The first acceptor of electrons from an excited chlorophyll molecule of Photosystem II is

A. Cytochrome

B. Iron-sulphur protein

C. Ferredoxin

D. Pheophytin

Answer: D

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