BIOLOGY

BOOKS - NEET PREVIOUS YEAR (YEARWISE + CHAPTERWISE)

PHOTOSYNTHESIS IN HIGHER PLANTS

Mcqs

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 not correct ?

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

B. increasing atmospheric CO_2 concentration upto 0.05% can enchance CO_2-fixation rate

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

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

Answer: C

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3. A plant in your garden avoids photorespiratory losses, has improved water use efficiency shows high rates of photosynthesis at high temperatures and has

improved efficiency of nitrogen utilisation. In which of the followubg physiological groups would you assign this plant

A. C_4

B. CAM

C. Nitrogen bar

D. C_3

Answer: A

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

A. two photosyntems operating simultaneously

B. photophosphorylation ad cyclic electron transport

C. oxidative phosphorylation

D. photophoshorylation and non-cyclic electron transport

Answer: A

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5. In a chloroplast the highest number of protons are found in

A. lumen of thylokoids

B. inter membrane space

C. antennae complex

D. stroma

Answer: A

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6. The oxygen evolved during photosynthesis comes from water molecules . Which one of the following pairs of elemnets is involved in this reaction ?

A. Manganese and chlorine

B. Manganese and potassium

C. Magnesium and molybdenum

D. Magnesium and chlorine

Answer: A

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7. The process which makes major difference between C_3 and C_4 plants is:-

A. glycolysis

B. Calvin cycle

C. Photorespiration

D. respiration

Answer: C

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8. In photosynthesis, light independent reactions take place at

A. thylakoidlumen

B. photosystem-I

C. photosystem-II

D. stromal matrix

Answer: D

9. Anoxygenic photosynthesis is characteristic of

A. Rhodospirillum

B. Spirogyra

C. Chlamydomonas

D. Ulva

Answer: A

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

A. transpiration

B. glycolysis

C. photosythesis

D. photorespiration

Answer: D

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11. The correct sequence of cell organelles during photores piration is

A. Cloroplast-Golgi bodies-mitochondria

B. chloroplast-rough endoplasmic reticulum-dictyosomes

C. chloroplast-mitochondria-peroxisome

D. chloroplast-vacuole-peroxisome

Answer: C

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12. CAM helps the plants in

A. secondary growth

B. disease resistance

C. reproduction

D. conserving water

Answer: D

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13. Of the total incident solar radiation 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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14. PGA as the first CO_2 fixation product was discovered in photosynthesis of

A. bryophyte

B. gymnosperm

C. angiosperm

D. alga

Answer: D

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15. C_4 plants are more efficient in photosynthesis than C_3 plants due to

A. higher leaf area

B. presence of larger number of chloroplasts in the leaf cells

C. presence of thin cuticle

D. lower rate of photorespiration

Answer: B

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16. Stroma in the chloroplasts of higher plant cantains

A. light-independent reaction enzymes

B. light-dependent reaction enzymes

C. ribosomes

D. chlorophyll

Answer: A

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17. Oxygenic photosynthesis occurs in

A. Chromatium

B. Oscilatoria

C. Rhodospirillum

D. Chlorobium

Answer: B

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18. Cyclic-photophosphorylation results in the formation of

A. NADPH

B. ATP and NADPH

C. ATP,NADPH and O_2

D. ATP

Answer: D

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19. Carbohydrates are commonly found as starch in plant storage organs. Which of the following five properties of starch (A-E) make it useful as a storage material

(A) Easily translocated

(B) Chemically non-reactive

(C) Easily digested by animals

(D) Osmotically inactive

(E) Synthesized during photosynthesis

The useful proeprties ar :

A. B and C

B. B and D

C. A,C and E

D. A and E

Answer: C

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

A. mesophyll

B. bundle sheath

C. phloem

D. epidermis

Answer: A

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

A. cytochrome

B. iron-sulphur protein

C. ferredoxin

D. quinone

Answer: D

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22. In photosystem-I the first electron acceptor is

A. cytochrome

B. plastocyanin

C. an iron-sulphur protein

D. ferredoxin

Answer: C

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

A. stroma of chloroplasts and peroxisomes

B. grana of chloroplasts and peroxisomes

C. stroma of chloroplasts

D. stroma of chloroplasts and mitochondria

Answer: A

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24. 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. 2

B. 6

C. 12

D. zero

Answer: C

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

A. effectve pumping of CO_2 into bundle sheath cells

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

C. Four carbon acids are the primary initial CO_2-fixation products

D. The primary fixation of CO_2 is mediated via PEP carboxylase

Answer: D

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26. In C_3 plants, the first stable product of photosynthesis during dark reaction is

A. Malic acid

B. oxaloacetic acid

C. 3phosphoglyceric acid

D. phosphoglyceraldehyde

Answer: C

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27. Plants adapted to low light intensity have

A. larger photosynthetic unit size than the sun plants

B. higher rate of CO_2 fixation that the sun plants

C. more extended root system

D. leaves modified to spines

Answer: A

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28. In chloroplasts, chlorophyll is presents in the

A. outer membrane

B. inner membrane

C. thylakoids

D. stroma

Answer: C

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29. Which fractions of the visible spectrum of solar radiations are primarily absorbed by carotenoids of the higher plants

A. violet and blue

B. blue nad green

C. green and red

D. red and violet

Answer: A

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30. In sugarcane plant $\hat{}$ $(14)CO_2$ is fixed in malic acid, in which the enzyme that fixes CO_2 is

A. fuctose phosphatase

B. ribulose bisphosphate carboxylase

C. phosphoenol pyruvic acid carboxylase

D. ribulose phosphate kinase

Answer: C

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

A. it is a characteristic of C_3-plants

B. it occurs in chloroplasts

C. It occurs in day time only

D. it is a characteristic of C_4-plants

Answer: D

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32. Which element is located at the center of the porphyrin ring in chlorophyll?

A. Manganese and chlorine

B. Calcium

C. Magnesium

D. Potassium

Answer: C

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33. Which of the following absorb light energy for photosynthesis : -

A. Chlorophyll

B. Water molecule

C. O_2

D. RuBP

Answer: A

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

A. ADP

B. ATP

C. RuDP

D. chlorophyll

Answer: B

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35. Which pigment system is inactivated in red drop?

A. PS-I and PS-II

B. PS-I

C. PS-II

D. None of the above

Answer: C

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36. Which pair is wrong

A. C_3-Maize

B. C_4-Kranz anatomy

C. Calvin cycle-PGA

D. Hatch and slack pathway-oxalo acetic acid

Answer: A

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37. how many turns of Calvin cycle yield one molecule of glucose?

A. 8

B. 2

C. 6

D. 4

Answer: C

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38. The first step in photosynthesis is the

A. excitation of electron of chlorophyll by a photon of light

B. formation of ATP

C. attachment of CO_2 to carbon sugar

D. ionisation of water

Answer: A

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39. Fixation of one CO_2 molecule through calvin cycle requires

A. 1 ATP and 2NADPH_2

B. 2 ATP and $2NADPH_2$

C. 3 ATP and $2NADPH_2$

D. 2 ATP and $1NADPH_2$

Answer: C

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40. Photochemical reactions in the chloroplasts are directly involved in the

A. formation of phosphoglyceric acid

B. fixation of carbon dioxide

C. synthesis of glucose and starch

D. photolysis of water and phosphorylation of ADP to ATP

Answer: D

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41. most abundant enzyme is

A. catalase

B. RuBisCO

C. Nitrogenase

D. Invertase

Answer: B

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42. Protochlorophyll differs from chlorophyll in lacking

A. 2 hydrogen atoms in two of its pyrrole rings

B. 2 hydrogen atoms in two of its pyrrole rings

C. 4 hydrogen atoms in one of its pyrrole rings

D. 4 hydrogen atoms in two of its pyrrole rings

Answer: A

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43. NADPH is generated through

A. photosystem-I

B. photosystem-II

C. anaerobic respiration

D. glycolysis

Answer: B

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44. The principle of limiting factors was proposed by:-

A. Blackmann

B. Hill

C. Arnon

D. Liebig

Answer: A

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45. Which of the following is present in Calvin Cycle.

A. Reductive carboxylation

B. Oxidative carboxylation

C. Photophosphorylation

D. Oxidative phosphorylation

Answer: A

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46. Photorespiration is favoured by

A. Nigh O_2 and low CO_2

B. Low light and high O_2

C. Low temperature and high O_2

D. low O_2 and high CO_2

Answer: A

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

A. aldehyde group

B. methyl group

C. carboxyl group

D. megnesium

Answer: A

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48. Photosynthetically active radiation (PAR) represents the following range of wavelength

A. 340-450 nm

B. 400-700 nm

C. 500-600nm

D. 400-950 nm

Answer: B

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49. Pigment acting as a reaction centre during photosynthesis is

A. carotene

B. phytochrome

C. P_{700}

D. cytochrome

Answer: C

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50. C_4 cycle was discovered by

A. Hatch and Slack

B. Calvin

C. Hill

D. Arnon

Answer: A

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51. Which one occurs both during cyclic and non-cyclic 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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52. Nine-tenth of al photosynthesis of world (85-90%) is carried out by

A. Large trees with millions of branches and leaves

B. algae of the ocean chlorophyll containing ferns of the forest

C. chlorophyll containing ferns of the forest

D. scientists in the laboratories

Answer: B

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53. 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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54. Maximum solar energy is trapped by

A. planting trees

B. cultivating crops

C. growing algae in tanks

D. growing grasses

Answer: D

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

A. Phosphoenol Pyruvate (PEP)

B. Ribulose 1,5-Diphosphate (RuDP)

C. Phosphoglyceric acid (PGA)

D. Ribulose monophosphate (RMP)

Answer: B

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56. Formation of ATP in photosynthesis and respiration in an oxidation process which utilises the energy from:-

A. cytochromes

B. ferredoxin

C. electrons

D. carbon dioxide

Answer: C

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

A. glucose

B. maltose

C. starch

D. sucrose

Answer: D

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58. Photosystem II occurs in

A. stroma

B. cytochrome

C. grana thylakoids

D. mitochondrial surface

Answer: C

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59. which one is a C_4-plant ?

A. papaya

B. pea

C. potato

D. Maize/corn

Answer: D

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

A. RuBP carboxylase

B. PEP carboxylase

C. carbonic anhydrase

D. carboxydismutase

Answer: B

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61. Chlorophyll a occurs in

A. all photosynthetic autotrophs

B. in all higher plants

C. all oxygen liberating autotrophs

D. all plants except fungi

Answer: B

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62. 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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63. Photosynthetic pigments found in the chloroplasts occur in

A. thylakoid membranes

B. plastoglobules

C. matrix

D. chloroplast envelope

Answer: A

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64. Ferredoxin is a constituent of

A. PS-I

B. PS-II

C. Hill reaction

D. P_{680}

Answer: A

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65. 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

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66. 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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67. Kranz anatomy is typical of

A. C_4-plants

B. C_3-plants

C. C_2-plants

D. CAM plants

Answer: A

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

A. phosphoenol-pyruvate

B. ribulose 1,5-diphosphate

C. oxalo acetic acid

D. phosphoglyceric acid

Answer: A

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69. 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 chloroplats

Answer: A

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70. The substrate for photorespiration is

A. phosphoglyceric acid

B. glycolate

C. serine

D. glycine

Answer: B

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71. A very efficient converter of solar energy with net productivity of 2-4kg/m^2 or more is the crop of:-

A. wheat

B. sugarcane

C. rice

D. bajra

Answer: B

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72. The size of chlorophyll molecule is

A. head 15×15Å tail 25Å

B. head 20×20Å, tail 25 Å

C. head 15×15 Å, tail 20 Å

D. head 10×12 Å, tail 15Å

Answer: C

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73. Carbon dioxide joins the photosynthetic pathway in

A. PS-I

B. PS-II

C. light reaction

D. dark reaction

Answer: D

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74. $NADP^+$ is reduced to NADPH in

A. PS-I

B. PS-II

C. Calvin cycle

D. Non-cyclic photophosphorylation

Answer: D

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