

A-Level Biology

Name: _____ Score: _____

1. In a chloroplast, the stacks of thylakoids (grana) are where:
 - ☐ the light-dependent stage happens
 - ☐ the Calvin cycle happens
 - ☐ DNA is stored
 - ☐ respiration happens
2. Water is split in the light-dependent stage by _____.

3. In fixation, the enzyme rubisco:
 - ☐ breaks down glucose
 - ☐ makes ATP
 - ☐ joins CO₂ to RuBP (5C) to make two molecules of GP (3C)
 - ☐ splits water
4. A limiting factor is:
 - ☐ the product of photosynthesis
 - ☐ the factor in shortest supply that holds back the rate of photosynthesis
 - ☐ the factor that is always present in excess
 - ☐ the colour of the leaf
5. The light-dependent stage produces:
 - ☐ only oxygen, nothing else
 - ☐ ATP and reduced NADP
 - ☐ glucose directly
 - ☐ carbon dioxide
6. Cyclic photophosphorylation:
 - ☐ happens in the stroma
 - ☐ uses photosystem I only and makes only ATP
 - ☐ uses both photosystems and makes ATP and reduced NADP
 - ☐ splits water

7. The enzyme that joins CO₂ to RuBP in the fixation step is _____.

8. Adding carbon dioxide can raise the rate of photosynthesis when CO₂ is the limiting factor.

☐ True ☐ False

9. The light-dependent stage happens in the stroma, and the Calvin cycle in the thylakoid membranes.

☐ True ☐ False

10. Photolysis splits carbon dioxide, releasing oxygen as a by-product.

☐ True ☐ False

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1. the light-dependent stage happens

The thylakoid membranes hold the pigments and carry out the light-dependent stage; the stroma runs the Calvin cycle.

2. photolysis

Photolysis releases electrons, H^+ and oxygen – the oxygen we breathe is a by-product.

3. joins CO_2 to RuBP (5C) to make two molecules of GP (3C)

Rubisco catalyses carbon fixation: $CO_2 + RuBP \rightarrow 2 GP$.

4. the factor in shortest supply that holds back the rate of photosynthesis

The limiting factor is whichever requirement is in shortest supply, capping the overall rate.

5. ATP and reduced NADP

It uses light to make ATP and reduced NADP, which power the Calvin cycle.

6. uses photosystem I only and makes only ATP

Cyclic photophosphorylation uses PSI alone and produces ATP only (no NADP reduced, no water split).

7. rubisco

Rubisco is the most abundant enzyme on Earth – it fixes nearly all the carbon in the living world.

8. True

Only the factor in shortest supply limits the rate, so increasing it speeds things up.

9. False

False. The light-dependent stage needs the pigments in the thylakoid membranes; the Calvin cycle uses enzymes dissolved in the stroma.

10. False

False. Photolysis splits water using light energy; the oxygen released comes from water, not from carbon dioxide.