A. Essay (2)

1) Explain photosynthesis: where it happens, what it needs, and what it produces. Photosynthesis happens in **chloroplasts** inside leaf cells. It needs **sunlight**, **carbon dioxide**, and **water**. With light energy, the plant makes **glucose** and **oxygen**. Stomata take in CO_2 from the air and water comes from roots. Oxygen is released through stomata. The plant uses the sugar to grow and stores extra as starch.

2) Compare photosynthesis and respiration in plants—how they're different, how they work together, and when they occur. Photosynthesis captures and stores energy in glucose (daytime). Respiration releases energy from glucose in the mitochondria (day and night). They are connected because photosynthesis makes the glucose that respiration uses. **Sometimes respiration only happens at night** *(Incorrect)* but actually it runs all the time. Together they keep cells supplied with energy.

B. Short Answer (3)

3) What is chlorophyll and why is it important? Chlorophyll is the green pigment that absorbs light energy to power photosynthesis. Without it, the plant couldn't capture the Sun's energy.

4) What do stomata do, and why can opening/closing them be helpful to a plant? Stomata are tiny pores for gas exchange; they open to let CO_2 in and close to reduce water loss. This helps balance photosynthesis with water saving.

5) Where and how do plants store extra glucose, and why is that useful? Plants store extra glucose as **starch** in leaves, stems, roots, and seeds. This stored food helps during low light or growth.

C. One-liners (5)

6) Word equation for photosynthesis (use words, not symbols). water + carbon dioxide + light → oxygen + glucose

7) Organelle for photosynthesis. Chloroplast

8) Organelle for respiration. Mitochondria

9) Gas taken in during photosynthesis. Carbon dioxide

10) Define transpiration in 10 words or fewer. Water loss from leaves via stomata.