A. Essay (2)

1) Explain photosynthesis: where it happens, what it needs, and what it produces.
Photosynthesis happens in **chloroplasts** inside leaf cells, using **chlorophyll** to capture sunlight. Plants need **carbon dioxide** from air and **water** from soil. With light energy, they build **glucose** (food) and release **oxygen**. Stomata let CO_2 in and O_2 out. The glucose is used for energy and growth, and extra is stored as **starch**.
2) Compare photosynthesis and respiration in plants—how they're different, how they work together, and when they occur. Photosynthesis stores energy in glucose (needs light; mainly day). **Respiration** releases energy from glucose in the **mitochondria** and occurs **all the time** (day and night). They are complementary: photosynthesis makes the glucose; respiration uses it to power cells.

B. Short Answer (3)

3) What is chlorophyll and why is it important? Chlorophyll is the green pigment that absorbs light energy to drive photosynthesis.

4) What do stomata do, and why can opening/closing them be helpful to a plant? Stomata are pores in leaves for gas exchange; opening lets CO_2 in but increases water loss, closing saves water.
5) Where and how do plants store extra glucose, and why is that useful? Plants convert extra glucose to **starch** and store it in leaves, stems, roots, or seeds—useful when light is low or energy demand is high.

C. One-liners (5)

6) Word equation for photosynthesis (use words, not symbols). Carbon dioxide + Water + Light → Glucose + Oxygen
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 vapor loss through leaf stomata