**Study Guide Questions for Topic 8: Metabolism, Cell Respiration, and Photosynthesis**

**Topic 8.1 - Metabolism**

1. What are metabolic pathways and how are they regulated? **(2 Marks)**
2. **Define** activation energy. **(1 Mark)**
3. **Distinguish** between competitive and non-competitive inhibitors. **(2 Marks)**
4. **Describe** end-product inhibition using threonine and isoleucine as an example. **(4 Marks)**
5. **Discuss** the use of enzymes inhibition in potentially treating malaria. **(4 Marks)-**

**Topic 8.2 – Cell Respiration**

1. **Describe** the function and importance of electron carriers. **(2 Mark)**
2. **Explain** the role of oxidation and reduction reactions in cell respiration. **(2 Marks)**
3. **Define** phosphorylation and describe how it changes the stability of molecules. **(2 Marks)**
4. **Distinguish** between glycolysis, the Kreb’s Cycle, and the electron transport chain. **(6 Marks)**
5. **Describe** the production of acetyl coA and **explain** its significance in aerobic respiration. **(3 Marks)**
6. **Outline** the process of chemiosmosis. **(4 Marks)**
7. **Explain** the role of oxygen in aerobic respiration. **(4 Marks)**
8. **Explain** how the structure of the mitochondria is suited to its function in cell respiration. **(3 Marks)**
9. **Define** Decarboxylation. **(1 Mark)**
10. **Draw, label, and annotate** a diagram of a mitochondrion. **(4 Marks)**

**Topic 8.3 – Photosynthesis**

1. **Distinguish** between the light-dependent and light-independent reactions of photosynthesis. **(4 Marks)**
2. **Describe** the structure and functions of photosystems. **(2 Marks)**
3. **Explain** the importance of creating a proton gradient and **describe** how it is done. **(2 Marks)**
4. **Describe** the structure and function of ATP synthase. **(3 Marks)**
5. **Outline** the functions of excited electrons in photosynthesis. **(2 Marks)**
6. **Describe** the function of carboxylase. **(1 Mark)**
7. **Discuss** the various reduction and oxidation reactions involved in photosynthesis. **(3 Marks)**
8. **Describe** functions of ATP in photosynthesis. **(2 Marks)**
9. **Explain** how the structure of the chloroplast is suited to its function in photosynthesis. **(3 Marks)**
10. **Describe** the work of Calvin on the carboxylation of RuBP. **(3 Marks)**
11. **Draw, label, and annotate** a diagram of the chloroplast. (**4 Marks)**