

## UNIT 4 REVIEW

### **A.) Metabolism**

1. Define Metabolism
2. Describe a Metabolic Pathway
3. Explain the difference between Catabolic and Anabolic pathways
4. Define Energy
5. Explain the difference between Potential and Kinetic energy
6. Define the First Law of Thermodynamics
7. Define the Second Law of Thermodynamics
8. What is Gibbs Free Energy and when is a reaction spontaneous?
9. Explain the difference between Exergonic and Endergonic reactions
10. Label the parts of an Energy Diagram

### **B.) ATP**

11. What family of organic compounds does ATP belong to?
12. Label an ATP molecule (phosphates/sugar/nitrogenous base)
13. Why is ATP an appropriate source of energy for cell? (compared to glucose)
14. How does ATP transfer energy to other molecules?
15. List three types of work accomplished by ATP in a cell

### C.) Enzymes

16. What is a catalyst? Why are enzymes considered "organic catalysts"?
17. How do enzymes increase the rate of chemical reactions?
18. Label the important parts of an enzyme
19. Define substrate
20. Describe the "Induced Fit Model" and draw an example
21. What is a cofactor?
22. What is a coenzyme?
23. List and describe all factors that affect the action of enzymes
24. Are enzymes changed by their reactions? Can enzymes be reused?
25. Describe irreversible inhibition
26. Explain the concept of feedback inhibition

### D.) Cellular Respiration

27. Define the life process of Cellular Respiration
28. List the three pathways of Cellular Respiration
29. Describe GLYCOLYSIS (reactants / products / outputs)
30. Where in the cell does Glycolysis take place?
31. Describe the CITRIC ACID CYCLE (reactants / products / outputs)
32. Where in the cell does the Citric Acid Cycle take place? How many turns?
33. Describe both parts of OXIDATIVE PHOSPHORYLATION (inputs / outputs)
34. Where specifically does Oxidative Phosphorylation take place?
35. Explain the difference between Alcoholic Fermentation and Lactic Acid Fermentation.
36. What is meant by oxidation/reduction reactions? Oxidizing / Reducing agent?

E.) Photosynthesis

37. Define Photosynthesis
38. Label the basic structure of a chloroplast
39. Identify the parts of a photosystem
40. Describe the Light Reactions (PSI and PSII)
41. What is chlorophyll? Which wavelengths are absorbed by chlorophyll? Which wavelength is mostly reflected?
42. What are the 3 products of the Light Reactions? Which go on to the stroma?
43. How is cyclic electron flow different from noncyclic electron flow?
44. Where in the chloroplasts (specifically) do the light reactions occur?
45. Describe the 3 phases of the Calvin Cycle (inputs / outputs) (Catabolic / Anabolic?)
46. What is the "fate" of PGAL?
47. Explain how C4 and CAM plants are different from C3 plants
48. What is photorespiration and why is it "BAD NEWS CHARLIE"?