# Bioenergetics: Energy Conversion in the Body

Biology · Answer Key · 12 Questions

### 1. What is metabolism defined as?

A) The breakdown of molecules
B) The synthesis of complex compounds
**C) The sum of all chemical reactions maintaining a cell's dynamic state**
D) The process of energy storage

### 2. Which process involves breaking down molecules to supply energy?

A) Anabolism
**B) Catabolism**
C) Photosynthesis
D) Glycolysis

### 3. What is the primary function of mitochondria?

A) Protein synthesis
B) DNA replication
**C) Energy production through the common catabolic pathway**
D) Waste removal

### 4. What are the two main components of the common catabolic pathway?

A) Glycolysis and fermentation
**B) Citric acid cycle and oxidative phosphorylation**
C) Photosynthesis and respiration
D) Digestion and absorption

### 5. Which molecule is the primary agent for energy storage and phosphate group transfer in cells?

A) DNA
B) RNA
**C) ATP**
D) Protein

### 6. What is the function of NAD+ and FAD in biological oxidation-reduction reactions?

A) Storage of glucose
**B) Transfer of electrons**
C) Structural support
D) Enzyme inhibition

**7. What molecule transports acetyl groups in the common catabolic pathway?**

A) Glucose
**B) Coenzyme A (CoA)**
C) Amino acid
D) Fatty acid

**8. What is the starting molecule that combines with Acetyl CoA to start the citric acid cycle?**

A) Citrate
**B) Oxaloacetate**
C) Isocitrate
D) Succinate

**9. What is the final product of the electron transport chain?**

A) Carbon dioxide
B) ATP
**C) Water**
D) Glucose

**10. How many ATP molecules are produced per C2 fragment that enters the citric acid cycle?**

A) 2
B) 6
**C) 12**
D) 36

**11. What type of energy is used to maintain the concentration gradient of K+ and Na+ ions across cell membranes?**

A) Mechanical Energy
B) Heat Energy
**C) Electrical Energy**
D) Chemical Energy

**12. Which cellular component removes damaged cellular components?**

A) Mitochondria
**B) Lysosomes**
C) Golgi bodies
D) Nucleus