Name: _____ **Date:** _____

Blueprint Sabotage: 7th Grade Advanced Cell Operations Quiz

Deconstruct cellular malfunctions and predict how organelle failure cascades through biological systems in this high-level formative assessment.

---

1. A researcher treats a plant cell with a chemical that specifically inhibits the formation of the middle lamella during cytokinesis. What is the most likely structural consequence for the tissue?

A. The cell membrane will fail to regulate metabolic absorption.
B. The mitochondria will stop producing ATP for respiration.
C. Adjacent cells will fail to adhere to one another properly.
D. The nucleus will be unable to replicate genetic material.

2. In a specialized secretory cell, such as a plasma B-cell producing antibodies, the _____ must be highly developed to manage the folding and transport of massive protein loads.

A. Rough Endoplasmic Reticulum
B. Smooth Endoplasmic Reticulum
C. Peroxisome
D. Centriole

3. If a cell's lysosomes were to suddenly rupture and release their contents into the cytoplasm, the change in pH would likely neutralize the enzymes before they could cause significant damage.

A. True
B. False

4. Which scenario best illustrates the concept of 'conductivity' at a cellular level using specific organelle interaction?

A. Movement of water across a semi-permeable membrane via osmosis.
B. Voltage-gated ion channels in the membrane creating an action potential.
C. The Golgi apparatus labeling a hormone for systemic release.
D. The cytoskeleton rearranging to allow for cytoplasmic streaming.

5. Anthrax toxin works by disrupting the communication between the cell membrane and the rest of the cell. This specifically targets the process of _____, preventing the cell from taking in necessary nutrients.

A. Metabolic absorption
B. Conductivity
C. Reproduction
D. Respiration

6. Cyanide binds to an enzyme in the electron transport chain. Trace the logic: which organelle is directly compromised, and which cellular function ceases first?

A. Nucleus; Reproduction
B. Mitochondria; Respiration
C. Ribosome; Secretion
D. Lysosome; Excretion

7. The presence of a massive central vacuole in a plant cell is primarily an adaptation for excretion of toxic metabolic byproducts into the soil.

A. True
B. False

8. During the synthesis of a complex glycoprotein, a sugar chain is added to a protein. If this sugar 'tag' is incorrect, the _____ will fail to sort the protein to its correct destination.

A. Nucleolus
B. Golgi apparatus
C. Chloroplast
D. Smooth ER

9. A cell is in a state of 'autophagy' where it begins to digest its own damaged mitochondria. Which organelle provides the enzymes necessary for this internal recycling?

A. Peroxisome
B. Autosome
C. Lysosome
D. Cytoskeleton

10. In highly active muscle tissue, you would expect to find a significantly higher density of mitochondria compared to inactive adipose (fat) tissue.

A. True
B. False