

7.012 First Section Self-quiz Solutions

1) and 2)

- a) **golgi apparatus** - stores, modifies, and packages proteins.
- b) **rough endoplasmic reticulum** - synthesis and sequestration of proteins that function outside the cytosol.
- c) **mitochondrion** - energy transformation - cell "power plant" - ATP synthesis.
- d) **smooth ER** - lipid synthesis, chemical modification of proteins.
- e) **lysosome** - a membrane-bound vesicle with hydrolyzing and digesting enzymes.
- f) **nucleus** - contains cellular DNA - stores most of the cell's information.
- g) **ribosomes on the rough endoplasmic reticulum** - protein synthesis.
- h) **nucleolus** - a spherical body found within the nucleus, where ribosomal RNA is synthesized.
- i) **plasma membrane** - separates the cell from the environment, regulates traffic of materials in and out of cell.

- 3 a)
- i) plasma membrane
 - ii) endoplasmic reticulum
 - iii) Golgi apparatus
 - iv) ribosomes on the rough endoplasmic reticulum
 - v) cytoplasm
 - vi) free ribosomes
 - vii) smooth ER
 - viii) mitochondrion
 - ix) Nucleus

- 3 b) How do prokaryotic cells differ from eukaryotic cells? **Prokaryotic cells do not have a nucleus nor organelles like mitochondria, ER, and Golgi apparatus.**
- 4) Currently, scientist estimate that life first appeared on approximately **4 billion** years ago.
- 5) A key point in the theory of evolution is: slight variations among individuals significantly affect the chance that a given individual will survive in its environment and reproduce. These variations among individuals are due to **mutations**.
- 6) Surface tension occurs in water because it has **hydrogen bonds**.
- 7) The building blocks of DNA are **nucleotides**.
- 8) The building blocks of proteins are **amino acids**.
- 9) All cells have a membrane composed of **phospholipids**.
- 10) In the process of glycolysis, cells make energy in the form of **ATP**.
- 11) Oxidation and **reduction** occur together.
- 12) What is a gene? **A segment of DNA that directs the production of a protein or RNA molecule.**
- 13) The "Central Dogma" states that information flow in the cell is from DNA to **RNA** to **protein**.
- 14) Are the genes in your eye cells the same as the genes in your gut cells? **The genes in the two are the same.**
- 15) Are the proteins in your eye cells the same as the proteins in your gut cells? **The proteins in the two are different.**