**Human Life**

Different organ systems have different functions thereby performing unique roles in physiology.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 a. Trillions of cells organized to maintain distinct internal compartments.

 b. Examples:

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : contains / separates

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : contains / separates

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : wrapped in C.T. to separate

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : barrier to outside

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 a. First Law of Thermodynamics: **Energy can neither be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-- it can only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

 b. Organism Basic Function : consume, convert, sustain, build and maintain

 c. Reactions

 1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: process whereby smaller, simpler molecules

are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into larger, more complex substances

 2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: process whereby larger more complex

substances are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into smaller, simpler molecules

 d. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1) sum of all anabolic & catabolic reactions that take place in the body

 2) Examples: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 e. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_) Every cell in the body

uses to store and release energy!

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 a. ability of an organism \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to changes

 1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: responding to change in immediate environment

 2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: adjusting to longer-term changes

 b. Examples: move toward food/water ; amoeba toward prey

dog barking at strangers / fish scared by noise

 heavier coat in winter/migrating

workout 🡪 sweat

4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 a. transportation both internally and externally; actions of joints, organs, cells

 b. Examples: coordinating muscle group actions for breathing, heartbeat

 skeletal muscles (voluntary); glands secreting; blood cells moving

through blood

5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a. changes in the body through life including

b. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: cell specialization due to a

differential gene expression

c. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: increase body size by increasing number of

cells, amount of cellular material, and size of some cells

d. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: formation of new cells for growth, repair or replacement

e. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: formation of new organism from parent organism

**Maintenance of Life**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (\_\_\_)

a. gas making up 20% of the air

b. key component in chemical reactions

c. releases energy from food substances

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : substances essential to survival

a. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (required in large amounts)

1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a) body’s functional chemicals dissolved/transported

b) environment for chemical reactions

c) most abundant component (70% mass)

d) regulates temperature

e) cushions, protects, lubricates

 2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : carbs, lipids

3) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : proteins

 b. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 1) vitamins

 2) minerals

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 a. a measurement of heat (product of metabolic reactions)

 b. narrow range for chemical reactions

 c. heat exposure/cold exposure

4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 a. force exerted by a substance in contact with another substance

 b. \_\_\_\_\_\_\_\_\_\_\_\_\_ pressure (aka~\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)of body fluids:

BP must be great enough to enable blood to reach all tissues yet low enough not to cause problems with blood vessels

c. Atmospheric : exerted by the mixture of gases (N2, O2) in atmosphere