**Biology 111 In-class Exam #2 Feb 25, 2013**

Exam Key: Correct answer in bold

1. All the following are features of the scientific method except:

a) hypothesis formulation b) observation **c) proving of the hypothesis**

d) experimentation e) making conclusions

1. The three most abundant elements in the human body are:

a) Oxygen Aluminum, and Silicon b) Hydrogen, Helium, and Oxygen

c) Oxygen, Nitrogen, and Argon **d) Oxygen, Carbon, and Hydrogen**

e) Oxygen, Nitrogen, and Calcium

1. How many covalent bonds are formed by an atom of Carbon (nucleus has 6 protons total)?

a) 1 b) 2 c) 3 **d) 4** e) None

1. An example of a polysaccharides is:

**a) cellulose** b) DNA c) RNA d) protein e) linoleic acid

1. Which of the following is associated with rough endoplasmic reticulum?

a) nucleolus **b) ribosomes** c) lipid synthesis d) plasma membrane e) DNA

1. Which of the following is associated with smooth endoplasmic reticulum?

a) nucleolus b) ribosomes **c) lipid synthesis** d) plasma membrane e) DNA

1. Vesicles, formed at the endoplasmic reticulum, pass to the \_\_\_\_\_\_\_\_\_\_\_\_\_ where molecules are modified and sorted before forming vesicles headed to final destinations.
2. brain **b) golgi** c) nucleus d) endotherm e) pancreas
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ refers to vesicle fusion with the cell membrane and release of vesicle contents to outside of the cell.

**a) exocytosis** b) lymphoma c) type 2 diabetes d) type 1 diabetes e) none of these

1. The death of pancreatic islet cells results in ...

a) exocytosis b) lymphoma c) type 2 diabetes **d) type 1 diabetes**  e) none of these

1. One of the most common health consequences of obesity is an increased risk of developing ...

a) exocytosis b) lymphoma **c) type 2 diabetes** d) type 1 diabetes e) none of these

1. The mitochondria are the site of ...

a) endocytosis **b) aerobic respiration** c) photosynthesis d) glycolysis e) a and c

1. Chloroplasts are the most common of a class of organelles called ...

**a) plastids**  b) nucleoli c) synapses d) plasmolysis e) diabetes

1. The endosymbiosis theory explains the origin of ...
2. plants b) mitochondria c) sunlight d) plastids **e) b and d**
3. The principle evidence for the endosymbiosis theory includes ...

a) lymphoma b) high respiration rates **c) DNA in organelles** d) extracellular calcium e) b and d

1. The cytoskeleton of the cell includes three types of protein fibers including microtubules, intermediate filaments, and …

a) fingerlings **b) microfilaments** c) macrophages d) macrofilements e) minifilements

1. Which of the following is **not** true?
2. Potential energy is stored energy b) Kinetic energy is movement energy

**c) One form of energy can’t be converted to another** d) Molecules contain chemical potential energy

1. The total energy everywhere is constant
2. A spontaneous reaction is always...
3. endergonic b) endothermic c) endoscopic **d) exergonic** e) exothermic
4. The initial input of energy required to start any reaction is referred to as...
5. digeotropism **b) activation energy** c) spontaneous energy

d) forgotten energy e) facilitation energy

1. To start a fire, it is easier to strike a match than to rub two sticks together because the match head chemicals react with O2 more easily due to low \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a) digeotropism **b) activation energy** c) spontaneous energy

d) forgotten energy e) facilitation energy

1. Catalysts are substances that \_\_\_\_\_\_\_\_\_\_\_ reactions but are not consumed themselves.

**a) accelerate** b) inhibit c) are required for all d) monitor e) both a and b

1. Almost all the catalysts of cells are made of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. cellulose b) DNA c) RNA **d) protein** e) linoleic acid
3. All **except** which one of the following are true of enzymes?
4. Most are globular in shape b) all contain an active site c) they lower activation energy

**d) most are steroids** e) heated they tend to denature

1. In coupled reactions ...

**a) an exergonic reaction provides energy for an endergonic reaction**

b) one reaction occurs as a two step process

c) one reaction is uncatalyzed a second is catalyzed

d) an exothermic reaction provides energy for an endothermic reaction

e) no catalysis occurs

1. Endotherms are often also called ....
2. spontaneous reactions b) cold-blooded c) exogenous reactions

**d) warm-blooded**  e) islet cells

1. Allosteric enzyme regulation involves...

a) cholesterol  **b) binding other than to the active site** c) binding to the active site

d) a byproduct molecule e) both a and d

1. Net movement of kinds of molecules in a gas or liquid in response to concentration gradients is called...

a) opposition **b) diffusion** c) dispersion d) obfuscation e) permeation

1. Active membrane transport ....

a) is an endergonic process b) moves entities against a concentration gradient

c) allows movement down a concentration gradient d) involves coupling reactions

**e) both b and d**

1. Passive membrane transporter includes movement ....
2. directly though the phospholipid bylayer b) through channels

c) through carriers **d) a, b, and c** e) a and b but not c

1. After first weighing it, you place a piece of carrot (which has been in the fridge for weeks) inside a beaker containing pure water. Later you observe that the carrot has \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**a) gained weight** b) lost weight c) changed color d) dissolved e) not changed

1. The stiffness of a fresh carrot, compared to the flexibility of one three weeks in your fridge, is a result of ...

a) gastritis b) fungal symbiosis c) gasification **d) osmotic pressure** e) poetic license

1. In osmosis water crosses membranes...

a) from high to low concentration b) from low to high concentration

**c) from high to low free water concentration** d) from low to high free water concentration

e) not at all

1. A hypertonic solution is one in which...

a) visibility is limited b) cells aggregate c) the dye color is visible d) cells swell **e) cells shrink**

1. The stroma is ...
2. a class of bacteria b) inside the inner membrane of the nucleus c) the center of a nerve cell

**d) inside the inner membrane of the chloroplast** e) the other name for the matrix

1. The principle photosynthetic pigment molecule in green plants is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a) chloroplast b) stroma  **c) chlorophyll** d) matrix e) nucleus

1. A light harvesting complex is...
2. a steroid cluster in the chloroplast inner membrane
3. a group of thylakoid proteins clustered around a reaction center
4. **a protein with three subunits each with several chlorophylls**
5. an electron transport chain between photosystems
6. the terminal electron acceptor of the light-dependent reactions
7. The water splitting enzyme passes electrons directly to...
8. **the P680 reaction center of photosystem 2**
9. the P700 reaction center of photosystem 1
10. an electron transport chain between photosystems
11. the terminal electron acceptor of the light-dependent reactions
12. NADP+
13. In the light independent reactions or “dark reactions” of photosynthesis begins when a molecule of \_\_\_\_\_\_\_\_\_\_\_ is combined with a five carbon sugar.

a) pyruvic acid  **b) CO2** c) O2 d) glucose e) ATP

1. The energy required to drive the “dark reactions” is provided by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which are produced in the light-dependent reactions.
2. ATP b) NADPH **c) ATP and NADPH** d) RNA e) DNA
3. Glycolysis occurs in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a) chloroplasts b) mitochondria c) the nucleus **d) the cytoplasm** e) endoplasmic reticulum

1. Glycolysis is a complex series of reactions but can be viewed more simply as two parts, glucose activation and energy harvest. In the glucose activation the glucose is made more energy rich (and more reactive) though use of \_\_\_\_\_\_\_\_\_\_\_\_.
2. 2 CO2 b) 2 pyruvic acids c) an ATP and an NADPH d) 2 NADPH **e) 2 ATP**
3. Subtracting the energy containing molecules used in glucose activation, how many of which types of energy storing molecules are produced overall by glycolysis?
4. 2 DNA b) 2 NADPH **c) 2 NADH and 2 ATP** d) 2 NADH e) 2 ATP
5. In the course of glycolysis each glucose molecule is split into two molecules of \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. CO2 b) O2 **c) pyruvic acid** d) linoleic acid e) DNA
7. Aerobic respiration occurs in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a) chloroplasts **b) mitochondria** c) the nucleus d) the cytoplasm e) endoplasmic reticulum

1. Aerobic respiration is complex but can be simplified into three steps. In the first of these steps molecules of pyruvic acid pass energized electrons to molecules of NAD+ and pass two carbons to an “carbon carrier molecule” forming \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. CO2 b) ATP c) O2 d) CoA **e) acetyl-CoA**
3. The second of aerobic respiration is the Krebs cycle. Each turn of the Krebs cycle alone releases \_\_\_\_\_\_\_\_\_\_\_\_ molecules of CO2?

a) none b) one **c) two**  d) four e) at least six

1. Each turn of the Krebs cycle by itself produces \_\_\_\_\_\_\_\_\_\_\_\_ molecules of NADH?

a) one b) two  **c) three**  d) four e) six

1. Besides NADH, other energy released in one turn of the Krebs cycle is directly capture in the formation of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. 1 FADH2 b) 1 ATP **c) 1 FADHand 1 ATP** d) 1 DNA e) 1 RNA
3. In the last step of aerobic respiration, NADH molecules pass energized electrons to an electron transport chain in the inner membrane. Movement of electrons through the electron transport releases energy used to pump\_\_\_\_\_\_\_\_\_\_\_\_ out of the matrix across the inner membrane.
4. CO2 **b) H+** c) O2 d) NADH e) ATP
5. At the end of the electron transport chain the electrons are passed to \_\_\_\_\_\_\_\_\_\_\_\_\_.

a) CO2 b) H+ **c) O2**  d) NADH e) ATP

1. Fermentation in animals converts pyruvic acid to...
2. CO2 **b) lactic acid** c) ethanol and CO2 d) glucose e) CO2 and water