**Biology 111 In-class Exam #1 *(Answer Key)* Feb 1, 2013**

For each question or statement select the best answer or completion. Mark your selections on a **scantron form** using a **pencil**.

1. Which of the following is not a concern or question for science?

 a) the origin of life on earth b) the composition of atomic nuclei c) the meaning of life

 d) the existence of God e) **both c and d**

1. It is a central assumption of science that:

a) life began in the sea b) **all events have natural causes** c) man evolved from monkeys

d) frogs and mice come from moist earth e) the universe is mostly hydrogen

1. Most monarch butterflies from the mid-western United States over-winter in …

a) Peru b) Cuba c) Arizona d) **Mexico** e) Argentina

1. Which of the following possible explanations for how monarch butterflies find their way to El Rosario is non-scientific or supernatural?
2. they orient their flight direction by the position of the sun.
3. they orient their flight direction by the position of the north star.
4. they fly perpendicular to the earth’s magnetic field.
5. **they are guided by the invisible spirits of their ancestors**
6. all the above are explanations are scientific.
7. Science is generally divided into two types. These include hypothetical or explanatory science and ....
8. **discovery science** b) maturation science c) conclusionary science

d) holistic science e) none of these

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. In science a causal explanation for something observed that has been supported by many experimental tests by different researchers is called a:

a) **theory** b) fact c) control d) hypothesis e) observation

1. The 2005 Nobel Prize in medicine went to two Australians (Barry Marshall and Robin Warren) who discovered...
2. Penicillin b) **the role of bacteria in stomach ulcers** c) a cure for arthritis

d) a cure for cancer c) none of these

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. Each specific type of atom (those with the same number of protons) is called a(n)...

a) **element** b) electron c) formula d) nucleus e) orbital

1. Each specific type of atom has a characteristic \_\_\_\_\_\_\_\_\_\_\_\_\_ which indicates both the number of protons, the number of electrons, and therefore its chemical reactivity.

a) free weight b) lunar position c) neutron d) day length e) **atomic number**

1. Individual atoms of a specific type may differ in atomic mass due to variable numbers of \_\_\_\_\_\_\_\_\_ in their atomic nuclei.

a) photons b) muons c) **neutrons** d) protons e) electrons

1. The body of “Ötzi the iceman”, found on the Austria-Italy border, has been dated to about 5300 years old by “carbon dating” in which the age of biological matter can be determined by the rate of conversion of:

a) 14N to 14C b) **14C to 14N** c) 1H to 1He d) 14C to 12C e) 12C to 14C

1. An ion is the name given to ...

a) **charged atoms** b) heavy isotopes c) radioactive elements

d) HIV type viruses e) atomic radii

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. The chemical bonds formed between O and H and between N and H are examples of ...

a) non-polar covalent bonds b) low interest bearing bonds c) familial bonds

d) **polar covalent bonds** e) high interest bearing bonds

1. Molecules that dissolve easily in water are referred to as being:

a) hydrophobic b) ionic c) **hydrophilic** d) amphiphilic c) covalent

1. Molecules that do not dissolve easily in water are referred to as being:

a) **hydrophobic** b) ionic c) hydrophilic d) amphiphilic c) covalent

1. Strictly defined by a chemist or biologist, organic molecules are molecules that ...

a) are pure b) **contain C and H** c) are free of pesticides

d) are from living things only e) are free of both herbicides and pesticides

1. The \_\_\_\_\_\_\_\_\_ group refers to a common functional group of biological molecules consisting of a Nitrogen atom bonded to two Hydrogen atoms...

a) **amino** b) carboxyl c) tribal d) phosphate e) intestinal

1. Large biological molecules are generally assembled from subunits in so called condensation reactions by removing...

a) a carbon b) covalent bonds c) **a water molecule** d) oxygen e) peptides

1. The major categories of biological molecules found in living things include all of the following except \_\_\_\_\_\_\_\_ .

a) lipids b) proteins c) **hydrocarbons**  d) nucleic acids e) carbohydrates

1. An example of a polysaccharides is:

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

1. Triglycerides include:

a) oils b) fats c) steroids d) **a and b but not c** e) a, b, and c

1. Phospolipids are examples of molecules that are

a) hydrophobic b) completely non-polar c) hydrophilic d) **amphiphilic** c) multi-valent

1. All the following except \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are steroids ...

a) testosterone b) cholesterol c) estradiol (an estrogen) d) ecdysone e) **phospolipid**

1. Proteins are polymers assembled by bonding together ...

a) petris b) oligos c) sugars d) **amino acids**  e) fish fins

1. The overall shape of most proteins is ...

a) amphiphilic b) herring-boned c) **globular** d) donut shaped e) cubic

1. The primary structure of a protein refers to...

a) the age of its constituent parts b) the number of its subunits

c) **its sequence of amino acids**  d) its repeating structures e) its overall shape

1. The nucleotides consist of 1-3 phosphates and an N-containing base linked to a central....

a) **5 carbon sugar** b) amino c) ion d) steroid e) grommet

1. DNA and RNA are both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

a) sugars b) nucleotides c) **nucleic acids**  d) carbohydrates e) steroids

1. One difference between DNA and RNA is that while DNA contains the bases A,T,G, and C, the bases in RNA include:

a) A, B, C, and D b) A,T,G, and W c) **A,C,G, and U** d) A,T,C, and U e) E, F, G, and H

1. Another differences between DNA and DNA is \_\_\_\_\_\_\_\_\_\_\_\_\_ while RNA is \_\_\_\_\_\_\_\_\_\_ .

a) **double stranded, single stranded** b) hydrophilic, hydrophobic

c) single stranded, double stranded d) older , younger e) hydrophobic, hydrophilic

1. A third difference between DNA and RNA is a missing ....

a) C b) **OH** c) amino d) phosphate e) N

1. Base-pairing in DNA is between:

a) A - U and G -C b) T - U and A -C c) **A - T and C -G**

d) A - A and T -T e) A - G and C -T

1. Who first coined the word "cell"?

a) **Hooke** b) Aristotle c) Darwin d) Pasteur e) Virchow

1. What instrument most advanced the understanding of cell structure and function?

a) **microscope** b) probe c) pasteur pipette d) bunsen burner e) petri dish,

1. Who is credited with formulating “the Cell Theory"?

a) Hooke b) Aristotle c) Darwin d) Pasteur e) **Virchow**

1. According to the Cell Theory all living things are composed of cells and ...

a) animal cells have the most DNA b) cells are of extraterrestrial origin c) cells are points in space d) prokaryotes have the largest cells e) **all cells arose from pre-existing cells**

1. Cells are small apparently because, above a certain size....

a) cell membranes are thermodynamically unstable b) the nucleus loses control of the cytoplasm

c) cytoplasm becomes increasingly viscous d) both a and b

e) **molecular transport is limiting due to a decreasing surface to volume ratio**

1. The basic difference between a prokaryotic cell and a eukaryotic cell is that the prokaryotic cell:

a) possesses membrane-bound organelles b) lacks DNA c) **lacks a nucleus**

d) is usually considerably larger e) is structurally more complex

1. Ribosomes:

a) have no known function b) **are made in the nucleus** c) have never been successfully detected

d) a and b but not c e) a, b and c

1. All cells possess all the following components: genetic material (in the form of DNA), protoplasm (or cell sap) and …

a) latexes b) plastids c) fixed endorphins d) **a cell membrane** e) b and c

1. Which of the following is the major component of the cell membrane?

a) sugars b) **phospholipids** c) testosterone d) carbohydrates e) nucleic acids

1. The major function of the cell membrane of all cells is to ...

a) detect sunlight b) **maintain the chemical composition of the cytoplasm**

c) detect electrical fields d) synthesize lipids e) protect the DNA from UV light

1. The term organelle designates ...

a) a multicellular structure with a common function within the body

b) the small inclusions found within all nuclei

c) regions of increased density within cells

d) **membrane bound structures within cells**

e) the class of structures including chloroplasts, chromoplasts, and amyloplasts

1. The nuclear envelope which surrounds the nucleus is formed of …

a) carbohydrates b) a protein web c) a membrane free of lipids

d) **an interconnected double membrane** e) two completely separate membranes

1. The nuclear envelope is studded with passageways to the cytoplasm called nuclear .....

a) fissures b) grommets c) straws d) openings e) **pores**

1. The contents of the cell nucleus are referred to as \_\_\_\_\_\_\_\_\_\_\_\_\_\_ because they readily strain and make seeing the nucleus easy under the microscope.

a) metamorphula b) cromagnon c) pâté de foie gras d) tincture e) **chromatin**

1. A nucleolus is:

a) an extra nucleus found in the cells of fish b) **a dark area in the nucleus where ribosomes are made**

c) an area where the nucleus is synthesized d) only found in cells of lower fungi

e) the area in a prokaryote where DNA is concentrated