BIOL 1114 Exam #2 (PREVIEW) October 15, 2018

The following material will appear on the upcoming exam. Use this preview to familiarize yourself with the material, and guide you in studying. Be sure to look up the definitions of any words you do not know. You are free to discuss this material or ask questions about it.

Use a #2 pencil to fill in the information on your NCS answer sheet.

- 1. Enter your last name and first name as indicated and darken the corresponding circles.
- 2. Enter your CWID in the spaces indicated for "Student ID" and darken the corresponding circles.
- 3. Enter 1832 in the spaces indicated for "Course number" and darken the corresponding circles.
- 4. Enter the form of the exam 001 or 002 in the spaces indicated for "SEC" and darken the corresponding circles
- 5. Write your O-Key Account Username above the words "Last Name".

Failure to perform this correctly will incur a -10 pt handling fee. Read all questions and answers carefully before choosing the single BEST response for each question. Feel free to ask the instructor for clarification.

A seal slides into cold salt water. Its metabolic rate remains unchanged.

Fishes have about a 0.9% salt concentration of solutes in their body fluids. Seawater has a 3.6% salt concentration and freshwater has a 0.2% salt concentration.

On a cool morning, a green grasshopper is standing on a yellow flower, on which she has laid the last of her eggs, when a painted bunting (a multicolored bird) flying overhead spots it and dives for it. The grasshopper reacts by leaping, landing on the leaves of another plant, which is in the bright sunlight. The bird lands on the twig of a nearby tree. Pat, who is wearing green-tinted sunglasses, observes this attempted predation with interest. The next leap of the grasshopper startles a mouse which runs into the web of a black-widow spider, which bites and injects its venom. Within seconds, the mouse undergoes severe spasms preventing it from escape. The spider then wraps it in silk and begins to suck out its bodily fluids. Alpha-latrotoxin (α -LTX), once thought to be unique to black-widow spiders (*Latrodectus spp.*), is the primarily toxic component of the venom. It is extremely effective on mammals and ineffective on insects.

Some art historians now speculate that the Italian lady Lisa Gherardini was the subject of Leonardo Da Vinci's famous painting, the "Mona Lisa". A recent medical article hypothesized that Lisa suffered from a disorder of the thyroid gland. In spite of her illness, Lisa was active in her merchant husband's business and enjoyed acquiring new cosmetics. Atropine, which blocks acetylcholine receptors on post-synaptic muscle cell, is produced by the Belladonna plant. Lisa likely used an extract of the Belladonna plant as a cosmetic. When she placed drops of the atropine-rich extract in her eyes, her ciliary muscles relaxed causing her pupils to enlarge.

In the Rocky Mountains, there are alpine lakes that are isolated from other water bodies. Some of these lakes have water fleas (*Daphnia* sp.) that likely arrived in the lakes during rare events when one or a few individuals were stuck to the foot of a duck. Due to the clear water and high elevation of the alpine lakes, the water fleas are exposed to high levels of UV radiation, which can cause high rates of mutations.

The inspiration for Frankenstein's monster was an actual experiment conducted in mid 1780s by Italian scientist Luigi Galvani. He connected the nerves of a recently dead frog to a long metal wire and pointed it toward the sky during a thunderstorm. With each flash of lightning, the frog's legs twitched and jumped as if they were alive.

A researcher exposes green algae to different light sources with different combinations of wavelengths. Compared with algae receiving white light (source A), the algae exposed to artificial light from source B re-mains healthy but produces less oxygen and has a slower growth rate. Algae exposed to artificial light from source C produces low amounts of oxygen, and a very low growth rate. The researcher graphed some of the data as follows:

