# LCCW/Toxicology Final Exam (WI15) due: by 5:00 PM, 26 March 2015

## NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

This electronic file as a Word document is provided to you as a take-home exam due no later than 5:00 PM on Thursday, 26 March 2015. If you are unable to open or access the Word file of this exam, contact me at djohnson@lifewest.edu to obtain a pdf version of the exam.

You are not allowed to consult with classmates or any individuals other than the instructor as you research, prepare and compose your responses to this examination and its questions. You may use the information available on MOODLE, the LCCW library, reference books and course text books, and on-line resources.

You must print out a hard copy for submission of your completed examination and return it to me no later than 5:00 PM on Thursday, 26 March 2015. Proofread and organize your work and assemble the exam before submitting it. No electronic submissions will be accepted.

Turn your completed exam in to me in person or place it in my mail box on campus.

By working the examination and submitting it for grading you are agreeing to work independently of all other individuals and you are certifying that all the responses and answers to the examination questions are your own work.

**\*\*\*Select and answer one (1) question from each of the four groups A, B, C, and D.\*\*\***

1. Environmental Toxins
   1. Mercury: Explain fully how the inclusion of mercury (Hg) into L-cysteine adversely impacts protein synthesis and increases the risk of neurological defects in fetal development.
   2. Mercury: Use the Hg calculator to compute the size of weekly servings of ocean-caught, wild swordfish, halibut, king mackerel, albacore, cod, and salmon that will prevent you from exceeding the EPA limit for your own body weight.
   3. Bromide: Thyroid function impairment occurs as free ionic bromide (Br-) competes for iodide ion uptake (I-). Ozonation to purify drinking water produces bromate (BrO3-). EPA has set a limit on bromate ion in drinking water. The question is how does the body convert the less toxic bromate ion found in drinking water into the more toxic Br- ion?
2. Toxic additives in Food Products
   1. Nitrates and nitrites: Comment on the necessity to apply sodium nitrate and sodium nitrite to processed meat products. Obtain data on the estimated per capita consumption of processed meats by the general public in comparison to food service provided to school children in public school systems. (The processed meats include cold cuts, cured hams, poultry, sausages, bacon, and luncheon meats)
   2. High Fructose Corn Syrup: Inflammation and fructose metabolism to aggravate the Metabolic Syndrome.
3. Management and Dietary Choices
   1. Chelation: Ethylenediamine tetraacetic acid (EDTA) is able to bind metal ions with very high affinity. Knowing this fact, why is it critical to only administer EDTA chelation therapy under strict medical supervision? What level of blood mercury (Hg) for an individual would warrant EDTA chelation therapy?
   2. Gluten: Identify the screening tests that will distinguish gluten sensitivity from the auto-immune condition associated with Celiac Disease. Explain why the nervous system is more adversely affected by an allergic reaction to gluten than is the GI tract. Find three qualified laboratories to which you would consider analyzing your patients’ samples.
   3. Soy: Discuss the risk to health from the consumption of GMO soy as compared to non-GMO soy. Discuss the inherent potential toxic effects of the isoflavonoids of soy that exhibit phytoestrogenic activity.
4. Personal care products, Life style choices and Medications
   1. Parabens: Create a table of personal care products with brands that contain parabens versus brands (or products) that do not. Include in the table: shampoo, deodorant, toothpaste, makeup (foundation, lipstick, eyeliner, shadow and other), hand moisturizers, and shaving gels.
   2. SSRIs: Discuss the alternative management of depression and mood disorders with therapies such as painting, exercise, massage, meditation, and others. Include what validated instruments you would use to track the progression of the patient through care and also how you would co-manage with medical primary care practitioners and psychiatrists.
   3. Nicotine: Provide at least two peer-reviewed references that give evidence that nicotine can be beneficial to individuals with Alzheimer’s Disease and Parkinsonism. From review of the articles, provide a mechanism of action for nicotine that can account for the possible beneficial effects for such individuals.