

## Semester I Exam Review

Your semester one exam is scheduled for 21 January from 9:15 am to 10:15 am. It is your responsibility to check the posted schedules to determine in what room your section will be taking this exam and to be there on time ready to take the exam. Read the school policy for making up this exam if you are absent. There are severe penalties for an unexcused absence from this exam or failing to make prompt arrangements for a make up. Do not miss this exam!

This exam will cover material from chapters 1 to 6 as the essay on your readings from *The Demon In The Freezer*. You can expect to see a variety of questions including fill in, multiple choice, odd word out, and short answer questions. There will also be data and diagrams that you will need to interpret. The following information is intended to give you some idea of the most important material you should concentrate on as you prepare for this exam. It is not intended to be a complete or comprehensive list of every point covered on the semester exam. You should also use your chapter tests, chapter syllabi, and homework assignments as a study guide. Don't forget your lab work. Information from these labs will be incorporated in to the semester exam.

The types of questions of your semester exam are:

- Part I: True and False, 10 questions worth one point each
- Part II: Odd Word Out, 10 questions worth one point each
- Part III: Multiple Choice, 10 questions worth one point each
- Part IV: Diagram Questions: 10 questions worth one point each.
- Part V: Short Answer Questions, 4 questions worth five points each.
- Part VI: Scientific Method Questions, 5 questions worth four points each.
- Part VII: Essay, worth 20 points.

Chapter 1, The Science OF Biology.

- Understand the function and the steps of the Scientific Method.
- Distinguish among the terms hypothesis, theory, and natural law.
- Be able to identify independent (or manipulated) and dependent (or responding) variables of an experiment. Understand the importance of control groups.
- Understand what "Biology" is and be able to list and explain the characteristics of life.
- Be able to explain how biology can be studied at various levels and give examples.
- Be able to use and identify the correct SI units used in Biology and be able to construct and interpret tables, line graphs, and bar graphs.

Chapter 2, The Chemistry Of Life.

- Recall your basic chemistry from Physical Science including the concepts of the atom, elements, compounds, atomic number and mass, isotopes, ionic covalent, polar, and hydrogen bonds.
- Know what an organic molecule is and the relationship between monomers and polymers.
- Be able to recognize the molecular structure of carbohydrates, lipids, amino acids, proteins, and nucleotides.
- Be able to give examples of these macromolecules, their functions, and characteristics
- Understand the differences between exothermic and endothermic reactions and the role of protein enzymes in these reactions in the cell.

Chapter 3, The Biosphere.

- Be able to define the study of "Ecology."
- Understand the various levels of ecological studies including the biosphere, ecosystems, communities, populations, and species. Be able to give examples of each.
- Be able to explain and describe the flow of energy through an ecosystem. In particular understand the role of autotrophs and heterotrophs, cell respiration, and photosynthesis. Be able to relate them flow of energy through an ecosystem to the laws of thermodynamics.
- Be able to describe the details of biogeochemical cycles including the water cycle, carbon cycle, and the nitrogen cycle. In particular know the role of biotic and abiotic elements in the biosphere that play a role in these cycles.
- Know how limiting nutrients function to determine the characteristics of an ecosystem.

#### Chapter 4, Ecosystems And Communities.

- Be able to describe the role of climate in the distribution of major climatic zones and the role of wind and ocean currents in the distribution of heat energy around the globe.
- Explain the difference between abiotic and biotic factors in an ecosystem. Be able to explain the concept of an ecological niche and the principle of competitive exclusion.
- Be able to name and describe the various types of symbiotic relationships studies in class including mutualism, commensalisms, predation, and parasitism.
- Understand the terms ecological succession and the difference between primary and secondary succession. Be able to describe examples of each.
- Understand the concept of a biome and be able to recognize major terrestrial and aquatic biomes

#### Chapter 5, Populations.

- Understand what a population is and the characteristics of all populations.
- Be able to name and describe the factors that contribute to the growth rate of a population.
- Be able to explain the difference between exponential and logistic population growth and the role of limiting factors in determining the carrying capacity.
- Distinguish between density dependent and density independent factors that control population growth and be able to describe examples of each.
- Be able to interpret age structure diagrams of human populations.

#### Chapter 6, Humans In The Biosphere.

- Appreciate the positive and negative impact of human activity on the biosphere.
- Be able to list, explain, and give examples of the HIPPO factors.
- Explain the difference between nonrenewable and renewable resources and be able to describe how we can manage these resources in a sustainable fashion.
- Be able to describe and give examples of biological magnification and its consequence to an ecosystem.

### The Essay Question

This essay question will be worth 20% of your exam grade. It is based on the book *The Demon in the Freezer* that you have been reading during the second quarter. You must prepare this essay in advance, but you will not be able to bring any material with you to the exam. As you prepare your essay, keep the following points in mind:

- Be sure that you read the entire essay question carefully. It has several parts each of which should be addressed in your work.
- Your essay should open with a thesis statement, include specific examples where appropriate, and end with a concluding statement.
- Your examples should be specific and from the book and your class discussions.
- Do not include extraneous material that does not address the questions.
- Be absolutely sure that your essay is written in your own words. Plagiarism from the book or another student will result in a score of zero for the essay.

Throughout this book the author discusses both the anthrax bacteria and the smallpox virus and the diseases they cause. Compare and contrast these two pathogens in the following areas.

1. Explain how small pox and anthrax are transmitted from one human to another or from other animals to humans. Discuss the similarities and differences in the symptoms of these two diseases.
2. Using examples from the book and our class discussions, explain why the threat of a small pox outbreak is more than just a medical threat and requires political, legal, and military efforts to contain this threat.
3. Using the example of Meschede, Germany and Bhola Island, explain how public health organizations at the local, national, and international levels coordinate their efforts to limit and contain the spread of a highly contagious disease such as small pox.