**Final Exam Review Topics**

The following is a list of topics you will want to know for the different parts of the final exam. \*\*This list may not cover everything on the final exam\*\*. I just provided the different topics to review, but you should go back to the materials we used throughout the year to cover each of these topics

**Multiple Choice - 25 questions**

There will be questions that involve reading several paragraphs/data tables or graphs that provide information on the next several multiple choice questions.

**Topics to review**

Evolution - genetic drift, mutation, gene flow, phylogenetic trees, speciation, natural selection

Meiosis - crossing over, difference in meiosis I and meiosis II, 3 sources of genetic variation in meiosis

Mendelian Genetics and Beyond - know all different types of problems

Animal behavior - evolution of altruism (inclusive fitness concept)

Osmosis - hypertonic, hypotonic, direction of movement, water potential problems

Gene expression - function of different regions of the operon, inducible versus repressible operons and their pros and cons. How gene expression could result in changes to fitness and be tied to cell communication

What are the pathway of information - Chapter 48 reading guide

Feedback loops - identify stimulus, signal response and if it’s a positive or negative feedback loop

understand treatments that would alter a malfunctioning feedback loop.

Know the details of the blood sugar feedback loops as an example of maintaining homeostasis

Protein synthesis - transcribe/translate sequence, different types of mutations

Protein structure - primary secondary tertiary quaternary. Be able to draw an amino acid and identify the R-group, the N-terminus, and the C-terminus. How do amino acids make up the 3-d structure of the protein (why are R groups important here?)

Surface area to volume ratio - efficiency of diffusion. How does this physical law lead to specialization of cells or organ systems that can drive the evolutionary history of organisms?

**Grid in questions - 4 questions**

Hardy Weinberg - know how to solve the problems and understand the concepts behind the equations

Graph interpretations - know the definitions of endotherms and ectotherms and how this relates to the metabolism (basal metabolic rate) of organisms. Describe and explain the trend seen in the size of an organism and its metabolic rate.

Why does temperature impact metabolism?

Punnett square probability problem

**Free Response Questions** - 1 short free response (questions 3-8 on practice exams)

Possible topics

1. Cell cycle -go over pogil and notes on what is happening at each of the different stages. How can mutations eventually disrupt the cell cycle, cell communication, and lead to cancer?

2. Mass of seedlings under different conditions (does cellular respiration increase or decrease an organism’s weight and why? Photosynthesis? Relate these back to NPP and GPP

3. Action potential - Graph, pathway of neuronal communication. Chapter 48 reading guide

4. Immune system - first versus second exposure, specific versus nonspecific response

5. Population density and growth rates. Make sure you can do all calculations, graph/experimental interpretation and analysis.

**Time Concerns**

On the AP test, you are given 90 minutes to answer 69 multiple choice/grid in questions.

90minutes / 69 questions = ~ **1 minute and 20 seconds per question** average

On the final exam you have 46 minutes total

29 questions at an average of 1 minute and 20 seconds per question = ~ 37.7 minutes on free response / grid ins

1 free response at 6 - 8 minutes

= ~ 46 minutes total