**Biology- Level 3- Common Final Exam Study Guide**

**Exam Rules:**

1. your exam will consist of 85 multiple choice questions (modified for choice and time)
2. you may use a completed final exam study guide on your exam
3. text books must be turned in the day of your exam
4. you must provide your own #2 pencil
5. all backpacks, cell phones and personal belongings should b left in your locker
6. please bring a book to read if you finish early (it must be kept under your chair)

**Part One: Nucleic Acids, Protein Synthesis and Mutations (Chapters 13 and 14.1)**

1. DNA the genetic material
2. searching for the Genetic Material
3. discovering DNA’s structure
4. DNA replication
5. replication proteins
6. List the scientists involved in discovering the structure of DNA and their contributions.
7. List the enzymes involved in DNA replication, transcription and translation and what are their individual roles in each.
8. What are the three types of RNA and what do each of them do.
9. What is the make-up of a nucleotide and what is its function?
10. Define replication, transcription and translation.

**Part Two: Cell Reproduction (Chapters 10 and 11.1)**

a) the cell cycle

b) phases of mitosis

c) meiosis as a chromosome reduction process

d) meiosis as a source of genetic variation

1. What are the 3 parts of interphase called and what occurs in each part?
2. What are the four stages of mitosis?
3. What occurs during each of the phases of mitosis?
4. What is the difference between chromatids, chromatin and chromosomes?
5. What is a gamete?
6. How many chromosomes do humans have in each of their somatic cells? Sex cells?
7. Why do gametes have half the number of chromosomes as somatic cells?

**Part Three: Mendel and Heredity (Chapter 12)**

1. Mendel’s experimental design
2. Mendel’s Laws
3. monohybrid and dihybrid crosses
4. heterozygous and homozygous
5. codominance
6. incomplete dominance
7. polygenic inheritance
8. sex-lined inheritance
9. pedigrees
10. genotypes and phenotypes
11. dominant and recessive
12. Define heredity and give an example.
13. List and define Mendel’s three laws.
14. What is the difference between a trait being dominant or recessive?
15. What is the difference between a genotype and a phenotype and give an example.
16. What is a sex-linked trait and where would it be found?
17. Which type of diagram shows the inheritance pattern of several generations?
18. What is the difference between multiple alleles and polygenic inheritance?
19. What is the difference between incomplete dominance and codominance?
20. What is an allele?

**Part Four: Evolution (Chapters 16,17, 18 and 19)**

1. evidence of evolution
2. Darwin’s theory of natural selection
3. patterns of evolution
4. classification
5. speciation
6. What are five types of evidence for evolution?
7. What is the difference between artificial selection and natural selection?
8. What are some factors/scientists who influenced Darwin’s work?

1. Define evolution and give an example.
2. Define adaptation and give an example.
3. Compare and contrast punctuated equilibrium and gradualism.
4. Define speciation and give an example.
5. What is a fossil and how do they form?
6. What is a population and give an example.
7. What are homologous structures and give an example.
8. What were Lamarck’s theories in regards to how organisms change over time?

**Part Five: Anatomy and Physiology (Chapters 34, 35, 36 and 38)**

1. digestive system
2. circulatory system
3. respiratory system
4. nervous system
5. muscular system
6. skeletal system
7. excretory system
8. homeostasis
9. Why is it important for an organism to maintain homeostasis?
10. Sequence the following terms from simplest to most complex: organ system, tissue, organ, organism, cell
11. Describe the structure and function of a neuron.
12. What is a synapse?
13. What types of tissues make up the skeletal system?
14. Which cells produce red bone marrow?
15. Compare and contrast the central nervous system and the peripheral nervous system.
16. Describe the primary function of the three types of muscles.
17. Compare a ligament and a tendon.
18. Trace the flow of blood through the heart.
19. What is the primary function of the large intestine?
20. List the parts that make up a sarcomere.
21. What is the difference between an artery and a vein?
22. Describe the bronchiole tree.
23. Describe how food gets “pushed” through the digestive system.
24. Where is bile made and what is its function?
25. Explain the path urine takes from the kidneys out of the body.
26. How does a neuron receive information from outside of the body?

**Part Six: Ecology (Chapters 4 and 5)**

1. food chain
2. food web
3. energy in an ecosystem
4. trophic levels
5. biogeochemical cycle
6. populations
7. predator-prey
8. exponential and logistic growth
9. biodiversity
10. succession
11. human impact
12. Distinguish between autotrophs and heterotrophs and give an example of each.
13. What are decomposers and why are they so important to the ecosystem?
14. What group of organisms is always found at the base of the food chain or food web?
15. Why is the transfer of energy in a food chain only about 10% efficient?
16. Explain the process of nitrogen fixation?
17. What is the difference between an organisms habitat and its niche?
18. Describe two major causes of ecological succession?
19. What is a biome?
20. Sketch the conditions under which logistic growth occurs.
21. Describe the conditions under which logistic growth occurs.
22. What is carrying capacity?
23. How do parasites serve as a density-dependent limiting factor?
24. Explain how density-dependent limiting factors can affect populations?
25. Describe how a predator-prey relationship can be a mechanism for population control.
26. List some things that have caused our population to growth rapidly since the 18th century.