

## Biology Semester 1 Exam Review Guide

### Unit1: Structure and Function

#### Chapter 1 – Biology in the 21<sup>st</sup> Century

1. Distinguish between the following key terms:

Biology	
Hypothesis	
Variable	
Controlled experiment	
Theory	
Model	
Technology	

2. Distinguish between qualitative and quantitative data.

	Define	Examples
Qualitative		
Quantitative		

3. Describe the study in mimicry, using king snakes and coral snakes. Identify the control in the experiment.

4. Apply hypothesis based science to a failed flashlight to fill in the blanks. Draw in arrows showing the sequence of steps used in hypothesis- based science. Include those that show what occurs if the test DOES and DOES NOT support the hypothesis.

Observation:

Question:

Hypothesis:

Prediction:

Test:

5. How is communication an important part of science? Describe the benefits scientists gain by sharing information with one another?

**Chapter 8: DNA and the Language of Life**

6. Distinguish between the following key terms:

Protein	
Amino Acid	
Denaturation	

7. The 20 amino acids vary only in their \_\_\_\_\_.

8. How does denaturation affect the ability of a protein to function?

9. How do the various kinds of microscopes differ as tools in the study of cells?

a. Light microscope–

b. Electron microscope (SEM, TEM) –

10. Explain why DNA’s structure is called “the double helix.”

11. What are the three parts of a nucleotide? Which parts make up the backbone of a DNA strand?

12. List the two base pairs found in DNA.

13. If six bases on one strand of a DNA double helix is AGTCGG, what are the six bases on the complementary section of the other strand of DNA?

14. What is DNA replication? Describe how DNA replicates by using a template. Explain which strands are new/daughter strands, and which strands are old/parent strands.

15. Distinguish between the following key terms:

Ribonucleic acid (RNA)	
Transcription	
Translation	
Codon	
Mutation	

16. Which molecule completes the flow of information from DNA to protein?

**DNA → \_\_\_\_\_ → Protein**

17. Describe how a mutation could be helpful rather than harmful.

18. How many codons code for the 20 different amino acids? Why is it possible for an amino acid to be specified by more than one kind of codon? Give an example using Fig 11-13.

19. How many start and stop codons are there? What are they?

20. List and describe two types of mutations that can occur within a gene.

21. Give an example of a mutagen/carcinogen.

22. What important discovery has led to the development of modern genetic engineering techniques?

23. Define Codons:

24. How many codons are in the following nucleotide sequences? How many amino acids would each sequence code for?

- a. AAATCACGC
- b. ATCCTTTAGGAA

25. Use the following Codon chart to identify the amino acid sequence for the following nucleotide sequences:

		Second Position					
		U	C	A	G		
First Position (5' end)	U	UUU } Phe UUC } UUA } Leu UUG }	UCU } Ser UCC } UCA } UCG }	UAU } Tyr UAC } UAA Stop UAG Stop	UGU } Cys UGC } UGA Stop UGG Trp	U C A G	
	C	CUU } Leu CUC } CUA } CUG }	CCU } Pro CCC } CCA } CCG }	CAU } His CAC } CAA } Gln CAG }	CGU } Arg CGC } CGA } CGG }	U C A G	
	A	AUU } Ile AUC } AUA } AUG Met	ACU } Thr ACC } ACA } ACG }	AAU } Asn AAC } AAA } Lys AAG }	AGU } Ser AGC } AGA } Arg AGG }	U C A G	
	G	GUU } Val GUC } GUA } GUG }	GCU } Ala GCC } GCA } GCG }	GAU } Asp GAC } GAA } Glu GAG }	GGU } Gly GGC } GGA } GGG }	U C A G	
						Third Position (3' end)	

- a. AUGCCCCUG
- b. AUGACAAAAGGU
- c. UCUCAUAAC

26. Give an explanation for the following.

- a. GAA --> GUA

27. What are the DNA Replication Base Pairing Rules:

- a. A pairs with \_\_\_\_\_
- b. C pairs with \_\_\_\_\_

28. What are the DNA--> RNA Base Pairing Rules of Transcription?

- a. A pairs with \_\_\_\_\_
- b. C pairs with \_\_\_\_\_

29. What does it mean when we say that DNA replication is semi conservative

**Human Anatomy and Physiology**

30. Identify the levels of structure in the human body

Level of Organization	Description

31. Identify the four major tissue categories and describe their functions-

Tissue Category	Function/ Description	Microscopic image

32. Define homeostasis and explain its importance

Definition	Importance

33. Describe how body temperature homeostasis is regulated by negative feedback-

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34. What is the function and related structures of the following body systems?

	Function	Structures in the System
The Excretory System		
The Cardiovascular System		

**Unit 2: Heredity: Inheritance and Variation of Traits**

35. Contrast the two main ways that organisms reproduce

	Definition	Examples
Sexual Reproduction		
Asexual Reproduction		

36. Name the stages of the cell cycle and explain in words and draw a diagram of what happens during each stage

Phase	Description
G1	
S	
G2	
Mitotic Phase	

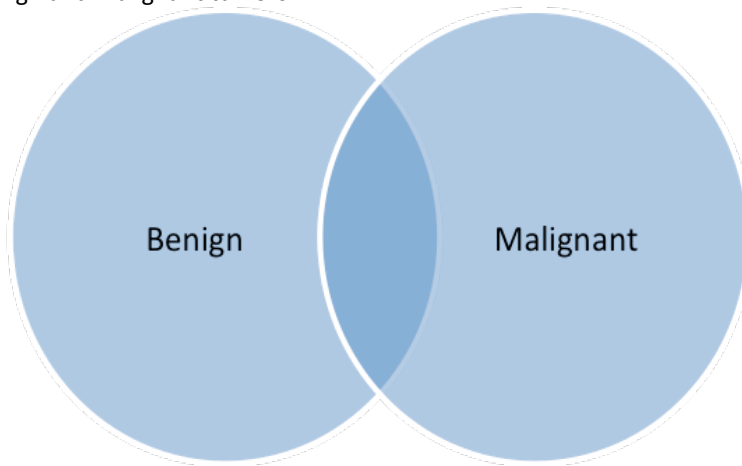
37. Name the stages of **mitosis** and explain in words and draw a diagram of what happens during each stage

Stage	Explanation	Diagram

38. **Explain** and **diagram** how cytokinesis differs in plant and animal cells.

	Explain	Diagram
In Animal Cells		
In Plant Cells		

39. Compare benign and malignant tumors



40. Contrast haploid and diploid cells

Haploid	
Diploid	

41. Summarize the process of meiosis-

