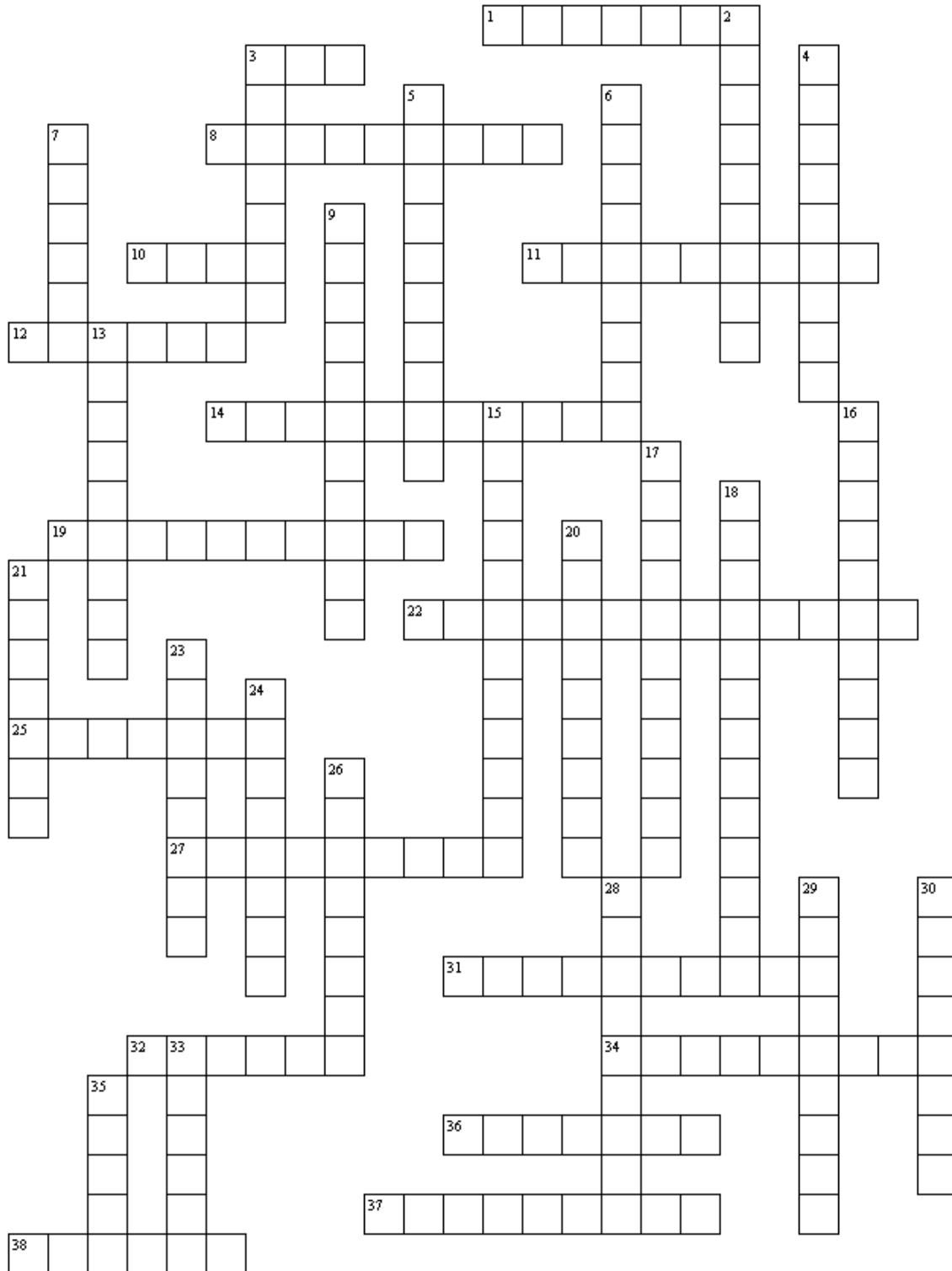


# Genetics & Disease Practice Test I

## Genetics Vocab







## Multiple Choice

- The process of mitosis ensures that:
  - each new cell is genetically different from its parent
  - each new cell receives the proper number of chromosomes
  - cells will divide at the appropriate time
  - DNA is replicated without errors
- For the DNA strand 5'-TACGATCATAT-3' the correct complementary DNA strand is:
  - 3'-TACGATCATAT-5'
  - 3'-ATGCTAGTATA-5'
  - 3'-AUGCUAGUAUA-5'
  - 3'-GCATATACGCG-5'
  - 3'-TATACTAGCAT-5'
- A synthetic mRNA of repeating sequence 5'-CACACACACACACAC... is used for a cell-free protein synthesizing system like the one used by Nirenberg. If we assume that protein synthesis can begin without the need for an initiator codon, what product or products would you expect to occur after protein synthesis?
  - one protein, consisting of a single amino acid
  - three proteins, each consisting of a different, single amino acid
  - two proteins, each with an alternating sequence of two different amino acids
  - one protein, with an alternating sequence of three different amino acids
  - one protein, with an alternating sequence of two different amino acids
- A human male carrying an allele for a trait on the X chromosome is:
  - heterozygous
  - homozygous
  - hemizygous
  - monozygous
  - holozygous
- Three types of RNA involved in comprising the structural and functional core for protein synthesis, serving as a template for translation, and transporting amino acid, respectively, are:
  - mRNA, tRNA, rRNA
  - rRNA, tRNA, mRNA
  - tRNA, mRNA, rRNA
  - tRNA, rRNA, mRNA
  - rRNA, mRNA, tRNA

6. Which mRNA codes for the following polypeptide? **met arg ser leu glu**

		Second Base								
		U		C		A		G		
U	U	UUU	phe	UCU	ser	UAU	tyr	UGU	cys	U
	U	UUC	phe	UCC	ser	UAC	tyr	UGC	cys	C
	U	UUA	leu	UCA	ser	UAA	STOP	UGA	STOP	A
	U	UUG	leu	UCG	ser	UAG	STOP	UGG	trp	G
C	C	CUU	leu	CCU	pro	CAU	his	CGU	arg	U
	C	CUC	leu	CCC	pro	CAC	his	CGC	arg	C
	C	CUA	leu	CCA	pro	CAA	gln	CGA	arg	A
	C	CUG	leu	CCG	pro	CAG	gln	CGG	arg	G
A	A	AUU	ile	ACU	thr	AAU	asn	AGU	ser	U
	A	AUC	ile	ACC	thr	AAC	asn	AGC	ser	C
	A	AUA	ile	ACA	thr	AAA	lys	AGA	arg	A
	A	AUG	met	ACG	thr	AAG	lys	AGG	arg	G
G	G	GUU	val	GCU	ala	GAU	asp	GGU	gly	U
	G	GUC	val	GCC	ala	GAC	asp	GGC	gly	C
	G	GUA	val	GCA	ala	GAA	glu	GGA	gly	A
	G	GUG	val	GCG	ala	GAG	glu	GGG	gly	G

- A. 3'-AUGCGUAGCUUGGAGUGA-5'  
 B. 3'-AGUGAGGUUCGAUGCGUA-5'  
 C. 5'-AUGCGUAGCUUGGAGUGG-3'  
 D. 1'-AUGCGUAGCUUGGAGUGA-3'  
 E. 3'-AUGCGUAGCUUGGAGUGA-1'
7. A cell that has 20 chromosomes undergoes mitosis. Which of the following is true?  
 A. two daughter cells will be created, each have 20 chromosomes  
 B. two daughter cells will be created, each have 40 chromosomes  
 C. 4 daughter cells will be created, each having 10 chromosomes  
 D. 2 daughter cells will be created, each having 10 chromosomes
8. If a DNA molecule is found to be composed of 40% thymine, what percentage of guanine would be expected.  
 A. 10%  
 B. 20%  
 C. 40%  
 D. 80%
9. Translation begins:  
 A. at the replication fork  
 B. on the lagging strand  
 C. at the start codon  
 D. in the nucleus
10. Proteins contain \_\_\_\_ different amino acids, whereas DNA and RNA are composed of \_\_\_\_ different nucleotides.  
 A. 20, 64  
 B. 3, 20  
 C. 4, 20  
 D. 20, 4

**Essay (Answer one of the following, including a diagram in your response:)**

Explain how the p53 gene can code for several different types of cancer. How is this an example of multiple allelic inheritance?

Explain protein synthesis, starting with chromosomal DNA and ending with a peptide.