

**ANSWER KEY**

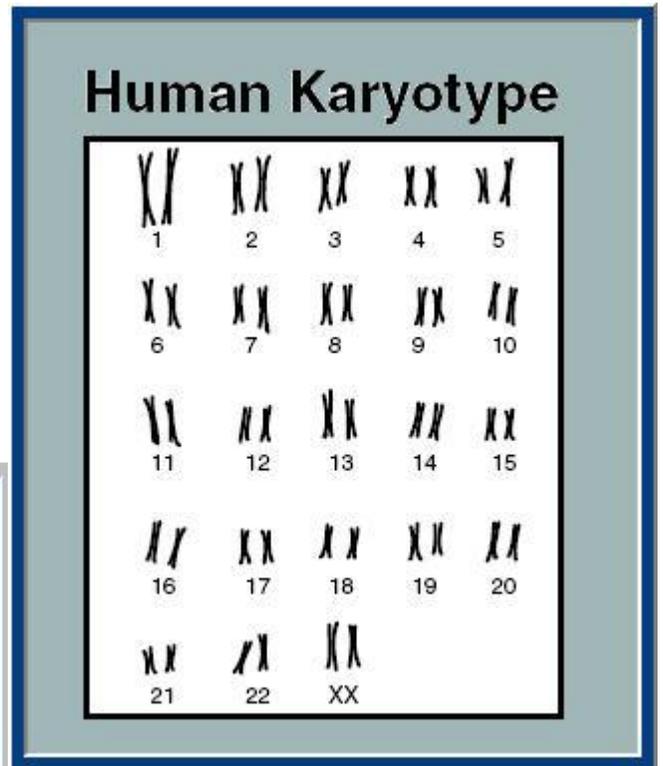
**BIO SOL Review 16 - DNA - RNA (17 QUESTIONS)**

1. (2006-7) One strand of DNA could be as long as a football field if it were stretched out lengthwise. One of the factors allowing DNA to fit inside the nucleus of a cell is its ability to -
- denature from the effect of an enzyme
  - break apart into separate genes
  - extend to form very long, thin molecules
  - coil tightly around associated proteins**

		Second Base				
		U	C	A	G	
U	Phe	Ser	Tyr	Cys	U	
	Phe	Ser	Tyr	Cys	C	
	Leu	Ser	stop	stop	A	
	Leu	Ser	stop	Trp	G	
C	Leu	Pro	His	Arg	U	
	Leu	Pro	His	Arg	C	
	Leu	Pro	Gin	Arg	A	
	Leu	Pro	Gin	Arg	G	
A	Ile	Thr	Asn	Ser	U	
	Ile	Thr	Asn	Ser	C	
	Ile	Thr	Lys	Arg	A	
	Met	Thr	Lys	Arg	G	
G	Val	Ala	Asp	Gly	U	
	Val	Ala	Asp	Gly	C	
	Val	Ala	Glu	Gly	A	
	Val	Ala	Glu	Gly	G	

**Genetic Code for Amino Acids**

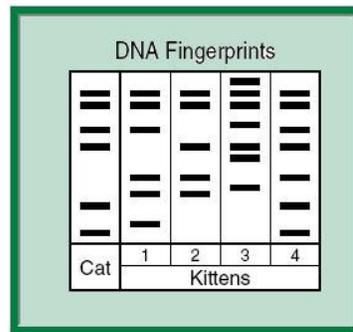
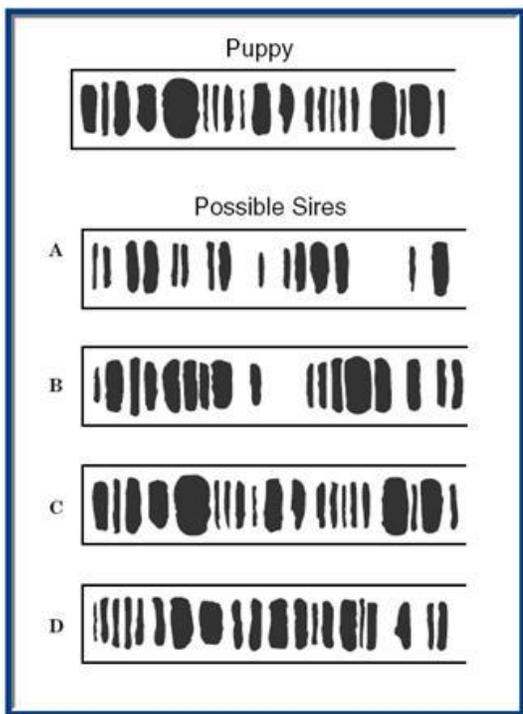
2. (2001-42) According to this table, a codon AGC is the code for which amino acid?
- Cysteine (Cys)
  - Leucine (Leu)
  - Serine (Ser)**
  - Tyrosine (Tyr)



3. (2001-22) A chart of human chromosome pairs is called a karyotype. What information is revealed in the karyotype above?
- Gene dominance
  - The age
  - The sex**
  - Trisomy
4. (2002-42) The triplet code of bases for RNA may be represented by all of the following except —
- CGG
  - CGT**
  - CGU
  - CGA

DNA Base Sequence Comparison	
Human	AGG CAT AAA CCA ACC GAT TAA
Chimpanzee	AGG CCC CTT CCA ACC GAT TAA
Gorilla	AGG CCC CTT CCA ACC AGG CCA

5. (2005-35) This chart compares the base sequences of homologous segments of DNA from three primates. Based on this information, how many differences in the resulting amino acid sequences would you expect to find between humans and chimpanzees?
- 2**
  - 3
  - 4
  - 6

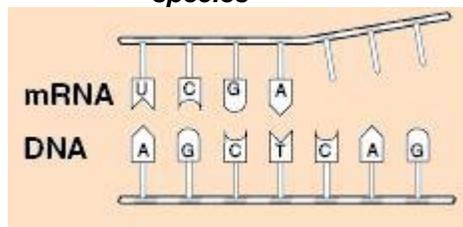


6. (2002-25) The DNA fingerprints were made from blood samples taken from a puppy and four possible sires of this puppy in an effort to determine the puppy's pedigree. According to this information, which sire was probably the father of this puppy?
- A      B      **C**      D

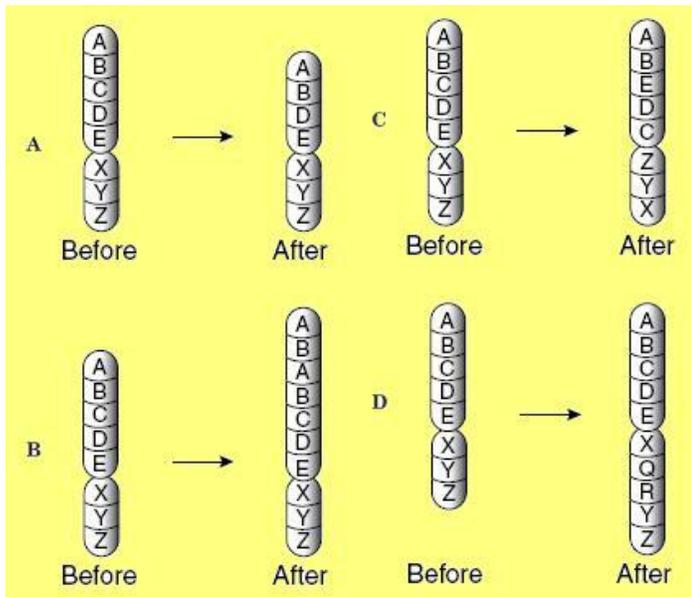


7. (2002-6) The picture shows an x-ray diffraction of DNA. The x-ray diffraction of DNA led to the idea that DNA —
- is a very long molecule
  - can copy itself
  - contains paired bases
  - is a double helix**
8. (2003-38) The parts of DNA that provide the code for proteins are the —
- phosphates
  - sugars
  - hydrogen bonds
  - nitrogenous bases**

9. (2004-7) The picture shows a segment of DNA from a cat. Which of these is most likely the kitten of this cat?
- 1
  - 2
  - 3
  - 4**
10. (2005-43) Which of these is most responsible for carrying coded information from the nucleus?
- mRNA**
  - The ribosomes
  - ATP
  - The cell membrane
11. (2005-13) Tissue samples taken from the heart and stomach of a grasshopper would be expected to have the same —
- metabolic rates
  - cell shape
  - DNA**
  - cell size
12. (2003-9) Which of the following would most likely change the current classification of two closely related flower species to a single species? (1 point)
- The discovery of a new, related species
  - The collection of seeds from each species
  - An analysis of photosynthesis for each species
  - An analysis of the DNA sequence of each species**



13. (2003-1) Which of these will complete the mRNA strand matched to DNA?
- AUG
  - CAG
  - GUC**
  - UAC
14. (2004-30) The process of DNA replication is necessary before a cell —
- makes a protein
  - codes for RNA molecules
  - divides into two cells**
  - modifies lysosome enzymes



(2004-13) Inversions in chromosomes occur when part of a chromosome breaks out and is reinserted upside down. Which of the diagrams below represents an inversion?

- e. A
- f. B
- g. C**
- h. D

15. (2001-7) In order to form recombinant DNA, scientists have found a way to cut a DNA segment using an enzyme named EcoRI. This enzyme cuts DNA wherever the sequence C-T-T-A-A-G occurs between the A and the G base. Which of these would result if EcoRI were used on the DNA in the diagram to the right?

- a. A
- b. B
- c. C**
- d. D

G-G-T-A-C-A-G-A-T-C-T-T-A-A-G-C-A-A

**A** G-G-T-A-C-A-G A-T-C-T-T-A-A G-C-A-A

**B** G-G-T-A-C-A G-A-T-C-T-T-A-A-G-C-A-A

**C** G-G-T-A-C-A-G-A-T-C-T-T-A-A G-C-A-A

**D** G-G-T-A-C-A-G A-T-C-T-T-A-A-G-C-A-A

### DNA Molecule Segment

Pairing of Nitrogen Bases

Adenine pairs with thymine.  
Cytosine pairs with guanine.

**F**

**H**

**G**

**J**

16. (2001-30) Which of these segments could be used to correctly complete the DNA molecule in the diagram above?

- a. F
- b. G
- c. H
- d. J**