DNA: MUTATIONS

You will need to refer to the table below (taken from one of the Chemguide pages) showing the three-base combinations used in DNA chains to code for the various amino acids.

first base in codon	second base in codon: T	second base in codon: C	second base in codon: A	second base in codon: G	third base in codon
T	TTT Phe	TCT Ser	TAT Tyr	TGT Cys	T
	TTC Phe	TCC Ser	TAC Tyr	TGC Cys	C
	TTA Leu	TCA Ser	TAA stop	TGA stop	A
	TTG Leu	TCG Ser	TAG stop	TGG Trp	G
C	CTT Leu	CCT Pro	CAT His	CGT Arg	T
	CTC Leu	CCC Pro	CAC His	CGC Arg	C
	CTA Leu	CCA Pro	CAA Gln	CGA Arg	A
	CTG Leu	CCG Pro	CAG Gln	CGG Arg	G
A	ATT Ile	ACT Thr	AAT Asn	AGT Ser	T
	ATC Ile	ACC Thr	AAC Asn	AGC Ser	C
	ATA Ile	ACA Thr	AAA Lys	AGA Arg	A
	ATG Met	ACG Thr	AAG Lys	AGG Arg	G
G	GTT Val	GCT Ala	GAT Asp	GGT Gly	T
	GTC Val	GCC Ala	GAC Asp	GGC Gly	C
	GTA Val	GCA Ala	GAA Glu	GGA Gly	A
	GTG Val	GCG Ala	GAG Glu	GGG Gly	G

1. Suppose a particular gene in a DNA coding strand included the base sequence:

. . . TCA TGC CCT CGA GCA GAA GGC . . .

This codes for the amino acids: Ser.Cys.Pro.Arg.Ala.Glu.Gly

In each of the following questions discuss if, and to what extent, the mutations might affect the protein acting as an enzyme.

a) Replacing the A in TCA TGC CCT CGA GCA GAA GGC by C.

b) Replacing the C in TCA TGC CCT CGA GCA GAA GGC by T.

c) Removing the CCT in TCA TGC CCT CGA GCA GAA GGC entirely.

d) Deleting the T in TCA TGC CCT CGA GCA GAA GGC.

e) Adding an A between the two Cs in TCA TGC CCT CGA GCA GAA GGC.