Name _____ **Period** _____

Regents Biology **Date** _____

PROTEIN SYNTHESIS PRACTICE 3

Interpreting diagrams is an important skill in learning science. The following diagram illustrates some aspects of protein synthesis — the making of a protein from a gene. Use the Universal Genetic Code Chart to answer the questions on the next page. Some DNA, RNA, and amino acid information from the analysis of a gene present in five different species is shown in the chart on the next page.

Universal Genetic Code Chart

Messenger RNA Codons and Amino Acids for Which They Code

First base	Second base: U	Second base: C	Second base: A	Second base: G	Third base
U	UUU, UUC: PHE UUA, UUG: LEU	UCU, UCC, UCA, UCG: SER	UAU, UAC: TYR UAA, UAG: STOP	UGU, UGC: CYS UGA: STOP UGG: TRP	U, C, A, G
C	CUU, CUC, CUA, CUG: LEU	CCU, CCC, CCA, CCG: PRO	CAU, CAC: HIS CAA, CAG: GLN	CGU, CGC, CGA, CGG: ARG	U, C, A, G
A	AUU, AUC, AUA: ILE AUG: MET or START	ACU, ACC, ACA, ACG: THR	AAU, AAC: ASN AAA, AAG: LYS	AGU, AGC: SER AGA, AGG: ARG	U, C, A, G
G	GUU, GUC, GUA, GUG: VAL	GCU, GCC, GCA, GCG: ALA	GAU, GAC: ASP GAA, GAG: GLU	GGU, GGC, GGA, GGG: GLY	U, C, A, G

1. Using the Universal Genetic Code Chart, fill in the missing amino acids in the amino acid sequence for **species A** in the chart *on the next page*.

2. Using the information given, fill in the missing mRNA bases in the mRNA strand for **species B** in the chart *on the next page*.

3. Using the information given, fill in the missing DNA bases in the DNA strand for **species C** in the chart below.

Species A	DNA strand:	TAC	CGA	CCT	TCA
	mRNA strand:	AUG	GCU	GGA	AGU
	Amino acid sequence:	____	____	____	____
Species B	DNA strand:	TAC	TTT	GCA	GGA
	mRNA strand:	____	____	____	____
	Amino acid sequence:	MET	LYS	ARG	PRO
Species C	DNA strand:	____	____	____	____
	mRNA strand:	AUG	UUU	UGU	CCC
	Amino acid sequence:	MET	PHE	CYS	PRO
Species D	DNA strand:	TAC	GTA	GTT	GCA
	mRNA strand:	AUG	CAU	CAA	CGU
	Amino acid sequence:	MET	HIS	GLN	ARG
Species E	DNA strand:	TAC	TTC	GCG	GGT
	mRNA strand:	AUG	AAG	CGC	CCA
	Amino acid sequence	MET	LYS	ARG	PRO

4. According to these amino acid sequences, which *two* plant species are the most closely related? Remember the more similar the amino acid sequence, the more related the species. Support your answer.

_____