

Answers to Problems:

Problem #1

5' cap **AUG CCC UAU AGC UAC GCA UUU AG**_{3'} (mRNA)
met— — — pro— — — tyr— — — ser— — — tyr— — — ala— — — phe (protein)

Problem #2

5' cap **AUG CCC UUA GCA GAG UCG AUA GCU UUU UAG CAU UAA** (mRNA)
met— — — pro— — — leu— — — ala— — — glu— — — ser— — — ile— — — ala— — — phe (protein)

Problem #3a — Frameshift mutation

5' cap **AUG ACC CUU AGC AGA GUC GAU AGC UUU UUA GCA UUA** (mRNA)
met— — — thr— — — leu— — — ser— — — arg— — — val— — — asp— — — ser— — — phe— — — leu— — — ala— — — leu (protein)

Problem #3b — Frameshift mutation — resulting in a “nonsense mutation”

5' cap **AUG CCU UAG CAG AGU CGA UAG CUU UUU AGC AUU AA** (mRNA)
met— — — pro (protein)

Problem #3c — Point mutation — resulting in a “missense mutation”

5' cap **AUG CAC UUA GCA GAG UCG AUA GCU UUU UAG CAU UAA** (mRNA)
met— — — his— — — leu— — — ala— — — glu— — — ser— — — ile— — — ala— — — phe (protein)

Problem #4

5' cap **AUG UUA AUA GCG AUU AUC AUG**
met—leu—ile—ala—ile—ile—met

(mRNA)

primarily nonpolar/hydrophobic polypeptide

5' cap **AUG UAU AAU AGC GAU UAU CAU**
met—tyr—asn—ser—asp—tyr—his

(mRNA)

polar/charged amino acids/hydrophilic protein

Problem #5 (A few of many examples of silent mutations)

CUU — leu

CUA — leu

CUG — leu

CUC — leu

UUU — phe

UUC — phe

CCU — pro

CCA — pro

CCG — pro

CCC — pro