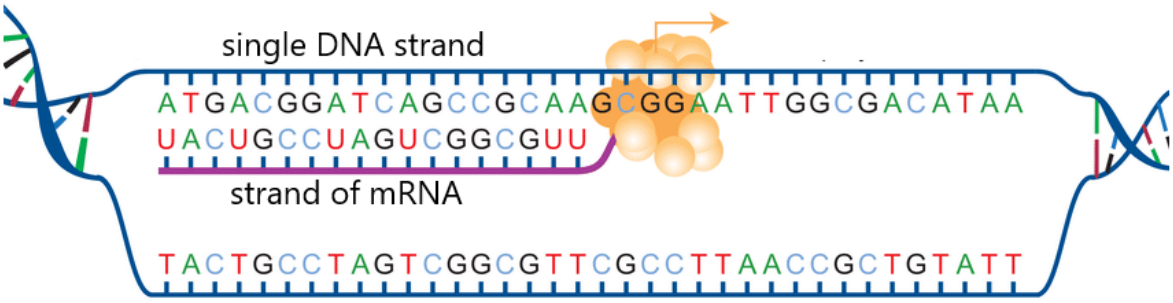
Question 9 DNA and RNA Review

A single strand of DNA is bonded to a complementary strand of mRNA. Upon analysis, the section was comprised of 10 % C and 15% T. What is the % of A,G and U?

The best way to solve a question like this is to consider a diagram such as the one below showing a single stand of DNA bonded to a strand of mRNA (as would be the case during transcription).



In this diagram we can see the following:
C and G will be equal. In the image above there are 10 of each.
So that makes,
G = 10
C = 10

It gets a little tricky when it comes to the A's.
We have A's in the DNA that are opposite U.
We also have A's in the mRNA that are opposite T.

So it's easiest to separate the A's into DNA A's and mRNA A's.
Again we can count these in the image above.

DNA A's = 6

mRNA A's = 2

Now thinking about the U's they are opposite the DNA A's and are therefore equal to each other.

U = 6

Finally thinking about the T's they are opposite the mRNA A's and are therefore equal to each other.

T = 2

Now back to our question.
A single strand of DNA is bonded to a complementary strand of mRNA. Upon analysis, the section was comprised of 10 % C and 15% T. What is the % of A,G and U?

The only difference is we are dealing with percentages as opposed to actual numbers.

So I would start with a blank template like the following.
Then write in the givens and continue using the same logic as above.

C = 10% (given in question)

G = 10% (because as you know %C = %G)

T = 15% (given in question)

mRNA A'a = 15% (because you know %T = %mRNA A's)

Now add all the percentages we know so far (10+10+15+15=50%)
Then subtract that from 100% (100-50=50%)
Now divide that remaining amount (50%) by 2 and split it evenly between the 2 remaining bases.

DNA A's = 25%

U = 25%

Lastly you can add the 2 A's together 15%+25% = 40%