BB101: 2022 Autumn semester

Quiz #3: Each correct answer is worth 1 mark. You will not be getting any partial marks so think and answer. You must answer only within the space provided. Time for taking this quiz is 10 minutes.

You are now an "expert" in biology and so decide to make a vaccine for SARS-CoV2.

You grow the SARS CoV2 virus in human cells in your lab and isolate the viral genome (RNA) from these cells. It is not easy to sequence RNA, however, it is very easy to sequence DNA. So to get the sequence of the SARS CoV2 viral genome, you want to convert the RNA into DNA

Question 1: How will you do this?

By reverse transcription / using reverse transcriptase

You find the sequence of the gene for Spike Protein that can be used for making vaccines. The sequence of the gene for Spike Protein from the first nucleotide of the START codon until the last nucleotide of the STOP codon is 3822 base pairs

Question 2: What is the sequence of a START codon?

AUG- methionine
(Must write AUG)

Question 3: What are the three STOP codons?

UAA, UAG, UGA

Question 4: Calculate the number of amino acids in the spike protein. Show your calculations.

Total number of nucleotides = 3822
Number of codons= 3822/3= 1274
Number of amino acids = 1274- 1 =1273
-1 as stop codon doesn't code for amino acids.

(Calculation is MUST. Just the number won't do)

Question 5: How can a piece of DNA or RNA injected into our bodies result in synthesis of a protein that is originally derived from a virus?

Because genetic code is universal.