1. Circle the letters that represent amino acids with carboxylic acid or carboxylate functional groups in their sidechain.

Α I K В  $\mathbf{C}$ D E F G Η J L S T M O P Q R U V W X N Y Z

2. Circle the letters that represent amino acids with amine functional groups in their sidechain:

Α В D E F Η I J K L C G Q P R S T U V W X M N O Y Z

3. Circle the letter or letters that represent amino acids that act as a nucleophile in serine proteases:

A I В  $\mathbf{C}$ D E F G Η J K L Q R S M N O P T U V W X Y Z

4. Circle the letter or letters that represent amino acids that act as a base in serine proteases:

A В  $\mathbf{C}$ D G Η I K L Ε F J R S T V W M N O P Q U X Y Z