Question 1: Describe DNA sequence variations that can be often observed among individuals of the same species. Discuss the possible phenotypic consequences of these DNA sequence variation, give examples, if possible. Discuss the technologies or methods that are often used in detect each of these variations.

Question 2: Describe the field of epigenetics study. How do epigenetic modifications affect gene expression and phenotype?

Question 3: Briefly describe the principles and applications of 2-dimensional gel electrophoresis, including 2d DIGE, for analysis of proteins.

Question 4: How does real time PCR work to quantify the initial amount of the DNA template? How should the method be modified to quantify the initial amount of RNA template extracted from tissue or cells?