

1. The completion of sequencing human genome suggests that there are about 30,000 genes in human genome. A cell isolated from a man's liver only expresses 15,000 proteins, how do you explain that? Another cell obtained from his spleen expresses more than 50,000 different proteins, what is your explanation. (20%)
2. Scientist has successfully "replicated" a living organism. The first live-birth animal created by this technique is a sheep named "Dolly". Some people think that Dolly is actually "older" than she is (i.e. She may be already 5 when she is only 2 years after birth). Can you explain this from the point of view of DNA replication. (20%)
3. When a protein is produced, it will be transported to the right place where it is supposed to go to. How can a cell recognize the destination of a particular protein? (15%)
4. The activity of an enzyme is usually regulated by several factors. Describe how pH, temperature, substrate, product, and enzyme concentration affects its enzymatic activity. (15%)
5. Describe the following terms or techniques (30%)
 - A. K_m of an enzyme
 - B. Maxam-Gilbert method
 - C. Tissue engineering
 - D. Ribonuclear protection assay
 - E. Light reaction
 - F. Beta oxidation
 - G. Gluconeogenesis
 - H. Two dimensional electrophoresis
 - I. Quaternary structure of protein
 - J. Spliceosome