※ 考生請注意：本試題不可使用計算機

一、問答題與簡答題：試題共 **13** 題，總分 **100** 分。

1.　Please describe the protective mechanism of the currently used vaccine against hepatitis B virus ? (5 %)

2.　Please describe the potential application of the PCR technology other than being used in the research. (5%)

3.　Please list two monoclonal antibody drugs currently on the market and their target diseases. (5%)

4.　You will develop "biological"drugs for treating rheumatoid arthritis, please describe the potential target molecules. (5%)

5.　Please define (a) proteomics and (b)transcriptome. (5%)

6.　Please define (a) chimeric antibody (b) humanized antibody (c) fully human antibody (5%)

7.　Please define miRNA and the use of miRNA. (10%)

8.　Please describe the use of nanoparticle in medicine. (10%)

9.　Please compare the advantages and disadvantages of protein drugs and small molecular drug. (10%)

10.　Many anticancer protein drugs can suppress tumor growth for only a defined period of time. The anticancer drug then becomes less effective. List the possible causes that anticancer drugs might become less effective after initial period of effective treatment, and give a short explanation and possible solution to the problem. (10%)

11.　Induced pluripotent stem cells (IPSCs) have become important tools for medical research. Give a brief explanation of what are the IPSCs and how to prepare IPSCs. Give an example of the potential application of the IPSCs. (10%)

12.　Protein over-expression in *E. coli* might result in the formation of inclusion body. Give a reasonable protocol for preparation and purification of the recombinant native proteins from the inclusion body. (10%)

13.　List and make a brief description of the methods that can be applied for the determination of the purity of protein samples. (10%)