

1. A research demonstrated that 4.1% of the vaccinated individuals develop influenza, but 12.5% of the unvaccinated individuals develop influenza. The vaccine effectiveness (%) is 67.2% ($[12.5-4.1 / 12.5] \times 100\%$). Please explain what this vaccine effectiveness (67.2%) means. (15 pt)
2. What does the **confounding** mean? (15 pt)
3. In causal inference, we are concerned about the **specificity** of the study results. What does this **specificity** mean? (15 pt)
4. Analysis of variance (ANOVA) examines the relationship between the variables in term of their variances. What is the most important assumption? (10 pt) What is the error mean square or the mean square for error? (5 pt)
5. Please explain the following terms: (5 pt, each)
 - a). The *power* of a test
 - b). The standard normal distribution
 - c). The coefficient of determination
 - d). Multiple regression
6. Please name a disease and elaborate on how to conduct a case-control study to reveal its risk factor. (20 pt)