※ 注意：請於試卷內之「非選擇題作答區」依序作答，並應註明作答之大題及小題題號。

1. 1-1.Please define odds and risk. (6%).
   1-2.Table 1 below represents disease incidence among exposed and non-exposed population. Please calculate Odds Ratio and Relative Risk from Table 1. (4%)

Table 1

	Group A (develop disease)	Group B (do not develop disease)
With Exposure	200	100
Without Exposure	400	500

2. 2-1.What's the difference between standard deviation and standard error? (5%)
   2-2. In what situation, standard deviation will equal to standard error? (5%)
3. 3-1.What is p-value? (4%)
   3-2.What factors may affect the value of p-value (assume data follows normal distribution)? (6%)
4. 4-1.What is power? (4%)
   4-2.What factors are associated with sample size (assume data follow normal distribution)? (6%)
5. In a clinical trial study, the average BMI of the case patients was 21, the 95% confidence interval was (19.2-22.5). For the control group, the BMI was 24, and the 95%CI was (23.0-25.0). Based on the statistics above, please provide your hypothesis and interpretation of the results. (10%)
6. A sample of 41 women over the age of 50 participated in a study examining the effects of sodium restriction on blood pressure (measured in mm of Hg). Diastolic blood pressure (DBP) was measured for each woman at baseline, and then again after 12 weeks on a sodium-restricted diet. Changes in diastolic blood pressure (final measurement minus baseline measurement) were recorded. For the 41 study subjects, the 95% confidence interval for population mean change in DBP is (-14.7176, 7.9176).
   (a) You wish to know whether sodium restriction has an impact on the average diastolic blood pressure for the population of females over the age 50 who follow the specific diet. State the null and non-directional alternative hypotheses suitable in this context. (5%)
   (b) Conduct a test at 1% level of significance of the hypotheses stated above using the given sample information or support your conclusion without conducting the test if you have reasonable evidence. (5%)
   (c) Following part b., what is the appropriate test and what are the assumptions that you need to make for conducting this test? (5%)
   (d) Suppose that instead of 41 subjects you had 8 subjects with the same 95% confidence interval as before. Moreover, you also know that the median of the sample difference blood pressure (final measurement minus baseline measurement) is 0.1 mm of Hg.
       i. Can you still believe in the assumptions you had to make for conducting the test above? Explain. (5%)
       ii. Is there any other test that you can do without making the assumptions above? With the information given above is it possible to conduct this alternate test? Explain. (You do not need to conduct this alternate test. You only need to explain whether with the given information you can conduct the test or not.) (5%)

見背面

7. A doctor has data from 2 studies on Lelandstatin, a new cholesterol drug. One of the studies is a randomized controlled trial and the other an observational study. Each study included 200 patients, half of whom took Lelandstatin for 2 weeks, while the other half did not take any drugs. For each patient, the doctor recorded the change in "bad" cholesterol, or LDL, levels:

LDL level change = LDL level at the end of the study − LDL level at the beginning of the study

The doctor made scatter diagrams of LDL level change vs. age for the treatment and control groups in each study. The means for the x-variable and y-variable are marked with lines on each diagram.

(a) For Study 1, is it a randomized controlled trial or an observational study? Why? (5%)
(b) For Study 2, is it a randomized controlled trial or an observational study? Why? (5%)
(c) Is the statement 'Lelandstatin increases LDL' true of false? Why? (5%)
(d) Is the statement 'Age is a confounder of the observational study' true of false? Why? (5%)
(e) Is the statement 'The observational study exaggerates the effect of Lelandstatin' true of false? Why? (5%)

試題隨卷繳回