※注意：請於答案卷上依序作答，並應註明作答之大題及其題號。

1、【20分】Let $y_i=\alpha+\beta x_i+\varepsilon_i$ be a simple linear regression model, where α is the intercept parameter, β is the regression coefficient and ε_i is the random error for the i^{th} subject. Please state the Gauss-Markov theorem in linear regression analysis.

2、【30分】Please use the following key words to write a short note.
Key words: binomial distribution, mean, variance, sample size, parameter, Poisson distribution, normal distribution.【限200字以內】

3、【20分】除錯題（仔細閱讀下文，請填入正確用字，或先找出錯誤，再更正。）

We have observed that Neyman-Pearson tests are not designed for interpret statistical evidence, and that their use for that purpose can lead serious errors in which observations that are evidence support H_0 over H_1 give the opposite interpretation. Strict Neyman-Pearson test procedures are in fact rarely used for interpreting and reporting scientific data. When a study or experiment is being planned, the researcher often uses Neyman-Pearson theory determine how many observations will be made. He models the study as a procedure for choosing within two hypotheses, H_0 and H_1, and specify the maximum tolerable error probabilities, α and β. Then two objectives, state in terms for the Neyman-Pearson hypothesis-testing paradigm, determine the sample size: 'We want to pretty sure (probability 1-α or greater) that we will not reject H_0 when it is true, and also pretty sure (probability 1-β or greater) that we will accept H_0 when H_1 is true'.

接背面

4、【30分】填充題（根據前後文填入適當的字句）

We are concerned in the monograph with how statistical data are interpreted as evidence. From this viewpoint the key difference between Neyman-Pearson tests and rejection trials is not in the existence, explicit or not, of an alternative statistical hypothesis, nor in the relationship between such an alternative and the (1) hypothesis. The key difference is that, unlike (2), (3) entail evidential interpretation of the observations. In these trials the (4) of H_0 is justified when x falls in the rejection region, it is said, because such observations 'do not agree with', or 'do not fit' the (5); they 'are inconsistent with', 'contradict', or event 'disapprove' it. If under H_0 the (6) of the rejection region is α, then the observations are said to 'provide sufficient (7) to cause rejection', or to be statistically (8)' at level α. Whatever expression is used, the implication is that observations in the rejection region are evidence (9) the hypothesis; and observations in a rejection region with very (10) α are very strong evidence.