Feedback on the exam of MATH4/68132 Longitudinal Data Analysis (2014/2015; Professor Jianxin Pan):

Question 1:

a) A few students are struggling to write down the model (1) into the matrix form.
b) The majority of students can answer the question correctly.
c) Most students can answer the first part of the question, i.e., the increasing relation of $\rho$ with the variance $\sigma^2_b$, but fail to interpret the phenomenon.
d) Some students just copied down the formula without detailed proof/derivation.
e) The same as d) above.
f) There is no problem for this question.
g) Some students directly said it is a Chi-square distribution, which is not true.

Question B2:

a) No problem for this question.
b) Some students have a difficulty to understand of constructing the REML estimates of variance components.
c) Majority of the students can answer this question correctly.
d) Some students gave too simple answers, and some did not understand what is meant by an AR(1) structure.
e) Majority of the students have no difficulty on this question.
f) Some students did not understand the null distribution of the testing statistic.
g) Most students can answer the question correctly.
h) Some students failed to interpret the models and the relationships questioned.

Question B3:

a) There is no problem on this question.
b) Some students do not understand the difference between the conditional variance and the marginal variance.
c) Students can write down correctly the formulae of the EBLUP, but forgot to replace the unknown parameters with their estimates.
d) Some students failed to give the correct form of the Wald test statistic.
e) Majority of the students can do this question.
f) Some students failed to understand the difference of the two models and were not able to answer the 2$^{nd}$ part of the question.
g) This question is easy for most students.
h) Most students can answer the 1$^{st}$ part of the question, but failed to comment on the nature of the differences identified.

Question B4:

Only a small number of the students chose to do Question B4, and majority actually chose the other three questions to answer.
a) A few of the students did not understand the model and cannot write down the correct form.
b) Some have no idea on the marginal log-likelihood function.
c) No problem for this question.
d) Majority can answer this question correctly.
e) A few of the students were not able to write down the relationship between the variance and the mean.
f) No much difficulty on this question.
g) Students can answer the 1st part of the question, but were struggling to interpret the estimated scale parameter.

h) The main difficulty for the students is the difference between the two models, i.e., GEE and the GLMM, and so some students were not able to answer this question.