Exam questions

1. Describe some designs and methods for obtaining evidence of measurement validity (use terms construct, content, face, criterion, concurrent, predictive, and incremental validity).
2. Describe some methods for describing measurement internal structure.
3. Define reliability under classical test theory (CTT), and describe some ways of estimating reliability (use terms test-retest, internal consistency, split-half, parallel forms, Cronbach's alpha). Describe some strategies to increase measurement reliability.
4. Define some tools of traditional item analysis to describe item difficulty, discrimination, item functioning, item impact on reliability and validity, and missed items. Discuss how the traditional item difficulty and the item discrimination RIT index are related to parameters of the regression model describing item functioning.
5. Discuss how regression analysis may be used to describe item functioning. Define and describe some models for binary items. In the 4PL model, derive interpretations for parameters a, b, c, and d.
6. Discuss how regression analysis may be used to describe item functioning. Define and describe some models for polytomous items, and interpret their parameters.
7. Define IRT models for binary items and model assumptions. Describe some estimation methods.
8. Define IRT models for measurement instruments on Likert scale, including the graded response model (GRM), graded rating scale model (GRSM), partial credit model (PCM), generalized partial credit model (GPCM), rating scale mode (RSM). For each model, discuss related regression models.
9. Define the nominal response model (NRM), and describe the relationship between NRM and the multinomial regression model.
10. Describe some methods for analyzing the differential item functioning (DIF): one traditional DIF detection method, one using a group/specific regression model, and one using a group/specific IRT model.
11. Describe the steps in the computerized adaptive testing (CAT).