

**Graduate Qualifying Examination
for Population Studies**

August 22, 2002

Answer the following 2 questions. (Answer questions 1 & 2!)

1. The UN Population Division has a website that allows one to project the population of the world and individual countries (<http://esa.un.org/unpp/>). The 2000 world population is estimated at slightly over 6 billion and the UN medium projection is 9.3 billion.

- a. Describe briefly the most widely used method for projecting forward populations.
- b. Are there any competing strategies that you would recommend or strategies that are promising?
- c. Describe the two factors that will contribute most to global population increase, according to standard projection procedures.
- d. Should we have any confidence in these long range projections? Do they have value? Why?
- e. The U.S. population is estimated at 283 million in 2000 and is projected to be 397 million in 2050. How are the components of US growth different than those of the global population?

2. See attached. Question 2 is in an Excel file. Show all calculations on excel spreadsheet and annotate where useful. Any text for question 2 also put in text boxes in Excel spreadsheet.

Answer 2 of the following 4 questions. (Choose 2 of 4.. your decision!)

1. The piecewise constant hazard rate/piecewise exponential survival function model and algorithm are a classical approach to the estimation of population life tables from occurrence/exposure mortality rates.
 - a) State the model specification for this piecewise model.

- b) State the equations for the estimation algorithm for this model.
 - c) What problems arise when this model is applied to age intervals of an abridged life table, i.e., estimated on the basis of mortality rates of 5-year age intervals or longer? Verbally describe (you do not have to give equations) the Keyfitz-Frauenthal approach to abridge life table estimation and how this improves estimates over the exponential model.
 - d) State the piecewise constant hazard/piecewise exponential model and estimation algorithm for increment-decrement life tables and comment on how this generalizes the classical single-decrement model to analogous matrix equations.
2. Recent theoretical and empirical analyses of international migration emphasize that migration is a social process rather than a single, bounded event. Elaborate on this position and its theoretical, methodological, and public policy implications. Next, formulate a model of migration as a social process based on life course research. Describe the methodology that you would apply to study such a process, drawing on your knowledge of life tables and event history modeling.
3. The citation below is from Larry Bumpass's PAA Presidential Address. Construct an argument, citing relevant theoretical or empirical literature, which supports or takes issue with Bumpass's argument.

*Bumpass, Larry L. 1990 "What's happening to the family? Interactions between demographic and institutional change." *Demography* 27:483-498.

Basic position:

P. 483 "I believe that the theoretical perspectives of a half-century ago were essentially correct: from Ogburn's emphasis on declining family functions, to Lorimer's description of increasing individualism at the expense of moral obligation. Goode's *World Revolution and Family Patterns* was on target with respect to many of the linkages between industrial economies and the reduction and reshaping of family roles, though I doubt that the conjugal family system should be seen as the end of this process.

P.484 "...subreplacement fertility is the norm in Western industrial societies, and the process underlying the long-term decline seem far from exhausted."

4. Describe what is meant by the "rectangularization" of the age-specific mortality curve. What are its implications for public policy and health care provision? Does empirical evidence suggest that "rectangularization" is taking place?