

DEMOGRAPHY PRELIMINARY EXAM

AUGUST 2000

AFTERNOON EXAM

IV. ANSWER EITHER A OR B.

- A. Identify and describe a recent methodological advance in studying fertility, union formation, mortality, or migration. What new understandings have been produced by research using the method? What is its future potential?
- B. Consider a closed population composed of two subgroups. Denote the size of the two groups at time t by $N_1(t)$ and $N_2(t)$ and consider the model:

$$\frac{dN_1(t)}{dt} = aN_1(t) + bN_2(t)$$

$$\frac{dN_2(t)}{dt} = cN_1(t) + dN_2(t)$$

where $dN_1(t)/dt$ and $dN_2(t)/dt$ denote change in the population size of groups 1 and 2, respectively, at time t .

- a. Provide a demographic interpretation of the parameters a , b , c , and d .
- b. Identify two circumstances in which the population dynamics for the two groups are more complex than for a single homogeneous population. Explain this complexity in terms of both short- and long-term population dynamics.
- c. Identify a substantive problem for which such a model might be applied. Explain how this model might yield different answers for your problem than more traditional models. Indicate model extensions, as appropriate.

V. ANSWER EITHER A OR B.

- A. The Baby Boom, one of the most significant demographic events of the last century, was generally not forecast by demographers. While the Baby Boom generation has had lingering effects in many arenas of life in the United States, some argue that the biggest repercussion is yet to come. How will the aging of the Baby Boom alter the structure of the American population? Be sure to discuss repercussions of population aging that go beyond economic arguments.
- B. Discuss trends in labor force participation by gender in the United States. In your answer, review: a) the conceptualization and measurement of labor force status, b) factors that have been argued to affect levels and trends, and c) the strengths and weaknesses of the available evidence.

VI. ANSWER EITHER A OR B.

- A. The U.S. House of Representatives recently passed legislation to abolish the marriage penalty in the U.S. income tax rates. One rationale for this legislation is that the current tax system encourages couple not to marry. To what extent do studies of the economic determinants of marriage and/or cohabitation support the latter reasoning?
- B. Critically review available theory and evidence on whether and how public assistance (e.g., welfare) programs in the United States or some other country affects demographic behavior.