

**UNIVERSITY OF SWAZILAND**  
**FINAL EXAMINATION PAPER 2007**

**TITLE OF PAPER:      DEMOGRAPHIC METHODS**

**COURSE CODE    :      DEM 202**

**TIME ALLOWED   :      THREE (3) HOURS**

**INSTRUCTIONS    :      ANSWER ANY FOUR (4) QUESTIONS.**

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**QUESTION 1 (COMPULSORY) (5+2+5+5+3 marks)**

Mortality data for coronary heart disease during 1991 in the United Kingdom and in Scotland alone were as follows:

Age Group	SCOTLAND		UNITED KINGDOM	
	Population (thousands)	Deaths	Population (thousands)	Deaths
Under 35	2513	18	28226	192
35-44	701	185	7932	1595
45-54	580	751	6593	6035
55-64	537	2346	5814	19515
65-74	441	4886	5075	46369
75 and older	328	8680	4009	97473
Total	5100	16866	57649	171179

(Source: Coronary Heart Disease Statistics, British Heart Foundation, June 1992, Annual Abstract of Statistics, 1993)

- Explain why simple crude rates may not be appropriate for comparing mortality across different geographical areas. Distinguish between direct and indirect standardization.
- Calculate the crude death rates in Scotland and the United Kingdom.

Using the data for the United Kingdom as the standard population:

- Calculate the age standardized mortality rate for coronary heart disease in Scotland. Compare this with the crude death rate.
- Calculate the standardized mortality ratio (SMR) for coronary heart disease in Scotland. What information is provided by the calculation?
- Calculate the indirect standardized death rate for coronary heart disease in Scotland. Comment.

**QUESTION 2**

Distinguish fully between the following measures:

- rate of natural increase and intrinsic growth rate;
- stationary and stable population;
- life expectancy at birth and lifespan;
- migration stream and return migration;
- generation life tables and conventional life tables.

### QUESTION 3

Using the information given in the Table below:

- Calculate the in- and out-migration rates for all regions.
- Calculate the inter-regional migration rate.
- Use the results obtained above to discuss the migration pattern in Swaziland during 1986-1991.

*Please highlight Table.*

**Table:** Resident Population of Swaziland in 1991 by Region of Enumeration and Region of Previous Residence (1986)

Region of Enumeration	Region of Previous Residence			
	Hhohho	Manzini	Shiselweni	Lubombo
Hhohho	169 878	4824	1887	2761
Manzini	7287	170 743	7321	4906
Shiselweni	1442	2995	135 396	1476
Lubombo	3130	6357	2615	139 439

(Source: Report on the 1991 Demographic and Housing Survey, Volume 2 – Analytical Report)

### QUESTION 4 (8+4+4+4 marks)

- Complete the following life table for Zambia, 1985:

Partial Life Table for Zambia, 1985

Age	$nq_x$	$l_x$	$ndx$	$nL_x$	$T_x$	$e_x$
0-1	0.02593	100,000		97815	6989030	69.89
1-4		97407	409	388649		
5-9	0.00240	96998	233		6502566	67.04
10-14	0.00221		214	483342	6018205	
15-19	0.00456	96551	440	481746		57.33

- b. Use this life table to answer the following questions:
- What is the likelihood that a child in Zambia will survive to age 15?
  - Calculate the percentage of children aged 5-9 who will be alive when they are 15-19 years.
  - Compute the crude death rate and crude birth rate.

**QUESTION 5 (6+2+3+3+3+3 marks)**

- a. Following are some data for a developed country:
- |     | 1946 | 1956 | 1986 | 1996 |
|-----|------|------|------|------|
| GRR | 1.79 | 1.10 | 1.79 | 0.87 |
| NRR | 1.34 | 0.98 | 1.72 | 0.86 |
- If the sex ratio at birth is 103, calculate the total fertility rate for each of the four periods.
  - Explain what these data indicate about trends in female mortality.
- b. Define and discuss the measures listed below and indicate their general use/value in demographic analysis:
- parity progression ratio;
  - child woman ratio;
  - net reproduction rate;
  - index of dissimilarity;

**QUESTION 6 (4+6+4+6 marks)**

- Show the equation used to compute the singulate mean age at marriage (SMAM) and define the components of the equation.
- Calculate the singulate mean ages at marriage (SMAM) using the data provided in the following table. Comment.

**Women Never Married (%)**

Age Group	Country A	Country B
15-19	50.1	98.0
20-24	13.1	63.2
25-29	6.8	25.7
30-34	5.7	13.8
35-39	5.3	11.1
40-44	6.0	10.8
45-49	5.8	9.9
50-54	6.5	8.7

- c. Is the SMAM measure computed above a real cohort's experience, or is it a synthetic measure? What does this imply for the interpretation of the SMAM?
- d. Marital status is an important fertility and mortality differential. Explain fully.