

UNIVERSITY OF SWAZILAND**SUPPLEMENTARY EXAMINATION PAPER 2005**

TITLE OF PAPER: DEMOGRAPHIC METHODS

COURSE CODE : DEM 202

TIME ALLOWED : THREE (3) HOURS

**INSTRUCTIONS : ANSWER ALL QUESTIONS FROM SECTION A
AND ANY THREE (3) QUESTIONS FROM
SECTION B.**

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SECTION A: ANSWER ALL QUESTIONS

QUESTION 1

- a. State the assumptions of a stationary population.
- b. Differentiate between the following pairs of terms and concepts:
- survival rate and death rate;
 - radix and ${}_1L_0$;
 - e_0 and T_0 ; and
 - l_5 and ${}_5L_5$.
- c. Use the following partial life table for country A to answer questions (i) to (vi) below:
- If ${}_1q_0 = 0.1$ and $a_0 = 0.3$, calculate ${}_1d_0$, l_1 and ${}_1L_0$;
 - If ${}_4q_1 = 0.05$, calculate ${}_4d_1$, l_5 and ${}_4L_1$;
 - If $M_{50+} = 0.05$, calculate L_{50+} ;
 - If ${}_{50}L_0 = 40,000$, what is T_0 and what is e_0 ?
 - What is the probability of an infant surviving from birth to age 35-39?
 - What proportion of those aged 30-34 in the stationary population survives to ages 45-49?

Table 1 Partial Life Table for Country A

Age Group	l_x	nL_x
0	1000	
1-4		
5-9		
10-14		
15-19		420
20-24		410
25-29		400
30-34		390
35-39		380
40-44		370
45-49		360
50+	700	

QUESTION 2

- a. Define the following fertility indices and show how each is calculated.
- (i) the crude birth rate;
 - (ii) the general fertility rate;
 - (iii) the total fertility rate;
 - (iv) the child woman ratio; and
 - (v) the gross reproduction rate.
- b. Outline the advantages and limitations of the above indices.

SECTION B: ANSWER ANY THREE QUESTIONS**QUESTION 3**

- a. State the theory of age and sex selectivity of migration.
- b. The following matrix shows the region of residence of a certain population according to the 1985 census enumeration and according to their reported place of residence in 1975.

Table 2: MIGRATION FLOW MATRIX

Region of Residence in 1975	Region of Residence in 1985				Total
	A	B	C	D	
A	15000	1500	1800	2500	20800
B	200	23000	2000	3500	28700
C	50	100	4200	200	4550
D	3000	1200	2500	40000	46700
Total	18250	25800	10500	46200	100,750

- (i) Find out the number of inter-censal in-migrants, out-migrants and net migrants for each district, and the country as a whole.
- (ii) Estimate the inter-regional migration rate.
- (iii) Estimate in-migration rate, out-migration rate for region "D" only.

QUESTION 4

- a. Distinguish between the following demographic terms and concepts:
- (i) prevalence rate and incidence rate;
 - (ii) abridged and complete life table;
 - (iii) infant mortality rate and life expectancy at birth;
 - (iv) pandemic and epidemic;
 - (v) in-migrant and immigrant.
- b. Using the data for Country A and Country Z as given below:
- (i) What are the infant mortality rates for country A and country Z?
 - (ii) What percent of the infant deaths in each country are neonatal deaths?
 - (iii) What does this imply on the likely level of development of country A compared with country Z? Explain.

Data for Countries A and Z in 1990

	Country A	Country Z
No. of Women 15-49	200,000	250,000
Children under age 5	400,000	550,000
Births	50,000	50,000
Infant deaths	7500	5000
Neonatal deaths	3500	1250

QUESTION 5

- a. Differentiate as clearly as possible, between the following pairs of concepts:
- (i) Age specific and order specific marital rates;
 - (ii) Mean age at marriage and Singulate mean age at marriage (SMAM); and
 - (iii) Divorce and legal separation.
- b. Using the data given in the table below, calculate the singulate mean ages at marriage for females in Mali and England and Wales. Interpret your results.

Proportions of Females Never Married: Mali, England and Wales, 1981

Age Group	% Single	
	Mali	England&Wales
15-19	69.5	97.96
20-24	13.4	63.22
25-29	1.1	25.74
30-34	0.7	13.83
35-39	0.0	11.09
40-44	0.0	10.82
45-49	0.0	9.95
50-54	0.0	8.74

QUESTION 6

- The direct and indirect methods of standardization are usually used to compare crude rates for two populations. Which method is preferable? Explain.
- Using the table below, compare and discuss death rates for country A and country B using the appropriate method of standardization.

Population and Deaths (in '000s) by Age, Countries A and B

Age Group	Country A		Country B	
	Population	Deaths	Population	Deaths
0-19	6418.0	30.6	1415.2	1.5
20-39	2736.1	4.8	1505.5	2.1
40-59	1220.6	4.7	1062.2	7.4
60+	588.0	8.0	742.3	34.1
Total	10962.7	48.1	4725.2	45.1

- What are the guidelines for choosing a standard population in standardization?

QUESTION 7

- Discuss the factors that generally account for sex differentials in mortality.
- Why is it necessary to adjust the conventional mortality rate? Explain fully.

- c. Use the following data for Country X to answer the questions below:

DATA FOR COUNTRY X

Number of women 15-49 in 1980	200,000
Population in 1970	1,000,000
Population in 1980	1,200,000
Births in 1970	50,000
Births in 1980	60,000
Deaths in 1970	20,000
Deaths in 1980	18,000
Births between 1970 and 1980	550,000
Deaths between 1970 and 1980	190,000
Girls under age 5 in 1980	200,000
Children under age 5 in 1980	400,000

- (i) What happened to the crude birth rate and crude death rate for country X between 1970 and 1980?
- (ii) Calculate the general fertility rate and child woman ratio for country X in 1980.
- (iii) What was the net migration of country X between 1970 and 1980?
- (iv) Calculate the annual rate of growth of the population between 1970 and 1980.