UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION 2011

TITLE OF PAPER: DEMOGRAPHIC METHODS

CORSE NUMBER: DEM 202

TIME ALLOWED: 3 HOURS

INSTRUCTIONS: ANSWER ANY FOUR QUESTIONS. ALL QUESTIONS ARE WORTH 25 MARKS EACH.

REQUIREMENTS: CALCULATOR

THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION HAS BEEN GIVEN BY THE INVIGILATOR

Question 1

(a) What is standardization? Why is it necessary to standardize rates? (5)

(b) What are the guidelines for choosing a standard population? (3)

(c) What is it the purpose of decomposing rates? (2)

d) Using the data provided in Table 1, compare and discuss the death rates for males in Liberia and Italy using the appropriate method of standardization. (15)

Table 1: Distribution of the Male Population and deaths by Age, Liberia and Italy, 1974.

Age	Italy Population (000's)	Liberia Population (000's)	Italy Deaths (000's)
0-4	4294.1	263.4	22.14
5-9	4517.1	230.5	1.61
10-14	4592.4	160.4	1.47
15-29	12336.5	401.3	8.40
30-44	10960.8	293.3	17.59
45-59	9571.2	139.2	59.57
60-64	2952.2	29.5	46.36
65+	6890.5	53.9	374.61
Total	**56114.8**	**1571.5**	**531.75**

Question 2

a) The data in Table 2 relate to the country of Malawi . They come from a sample survey of the population of this country which took place in 1992. You are also told that the total number of urban women in the survey 1334 and that the total number of rural women in the survey is 10 518.
   i) Calculate the general fertility rates for rural and urban areas.(12)
   ii) Calculate the total fertility rates for urban and rural areas.(2)
   iii) What do the results tell you about fertility in Malawi? (2)

Table 2: Proportion of women in rural and urban areas of Malawi and ASFR per woman by age, 1992

	% of all women/ age group		ASFR per woman	
Age	**Urban areas**	**Rural areas**	**Urban areas**	**Rural areas**
15-19	9.7	9.4	0.135	0.165
20-24	10.1	7.8	0.268	0.291
25-29	9.0	6.3	0.242	0.273
30-34	6.3	5.3	0.210	0.261
35-39	4.7	4.4	0.149	0.202
40-44	3.0	4.4	0.086	0.123
45-49	1.9	3.1	0.012	0.062

b) A certain population has the following parity progression ratios:

$P_1 = 0.862$
$P_2 = 0.804$
$P_3 = 0.555$
$P_4 = 0.518$

Assuming that no woman in this birth cohort had a fifth child, out of 1 000 women calculate:

i) the number of women who remain childless (2)
ii) the number of women who have exactly one child? (3)
iii) the total fertility rate (4)

Question 3

a) Distinguish between complete and abridged life tables. (5)

b) Given the following life table values, compute:

a. ${}_5L_{20}$ (2)
b. l_{30} (2)
c. e_{25} (2)

Age	${}_nq_x$	l_x	${}_nd_x$	nLx	T_x	e_x
20-24					5 375 000	67
25-29		75 000	5 000	350 000	5 000 000	
30-34						

c) Differentiate as clearly as possible, between the following pairs of concepts:

a. Fecundability and Reproductivity (4)
b. Incidence and Prevalence (2)
c. Net Reproduction Rate and Gross Reproduction Rate (4)
d. Migration and mobility (4)

Question 4

a) Discuss the factors that explain why females generally live longer than males. (9)

b) Use the data below for Country X to answer the following questions:

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) Calculate the crude birth rate and crude death rate for 1970 and 1980. (4)

(ii) What happened to the crude birth rate and crude death rate between 1970 and 1980? (2)

(iii) Calculate the general fertility rate and the child woman ratio for country X in 1980 (4)

(iv) Calculate the annual rate of growth of the population between 1970 and 1980. (2)

c) Why is it necessary to adjust the conventional mortality rate? Explain fully. (4)

Question 5

a) Populations that have a low mean age at marriage tend to have relatively higher levels of fertility. Briefly discuss this statement.(6)

b) Using the data in Table 3, calculate the Singulate Mean Age at first Marriage (7)

Table 3: Percentage never married males, East Sussex, 1991

Age	**Percentage single**
15-19	99.6
20-24	89.1
25-29	58.6
30-34	33.2
35-39	20.8
40-44	13.7
45-49	10.9
50-54	10.0

c) You are given the following gross nuptiality table for a hypothetical population. Fill in the missing values numbered (i) to (vi) in Table 4, showing clearly the formulae and notations used for each answer. (12)

Table 4: Gross Nuptiality Table for a Hypothetical Population

Age	nM_x	$_nN_x$	S_x	$_nH_x$	$_nE_x$	nLx	T_x	P_x	e_x
15-19	0.0630	0.27215	100000	27215	62071	431962	1750292	0.6207	17.5
20-24	0.0794	0.33120	72785	24106	34856	(iv)	(v)	0.4789	18.1
25-29	0.0290	0.13534	48679	6588	10750	226925	1014670	0.2208	(vi)
30-34	0.0100	(i)	42091	2048	(iii)	205335	787745	0.0989	18.7
35-39	0.0050	0.02492	40043	998	2114	197720	582410	0.0528	14.5
40-44	0.0031	0.01522	(ii)	594	1116	193740	384690	0.0286	9.9
45-49	0.0027	0.01357	38451	522	522	190950	190950	0.0136	5.0
50-54	0.0010	---	37929	---	---	---	---	---	---

Question 6

Describe the following measures of intercensal migration. Make sure to include the assumptions and limitations:

i. National Growth Rate (6)
ii. Survival Ratio (10)

Use the information given in the table below to calculate:

a) the inter-regional migration rate. (4)
b) Use the results obtained to discuss the migration pattern in Swaziland in 1966. (5)

Table 3: African Population born in Swaziland by Region of birth and Region of enumeration, 1966

Region of	Region of Birth			
Enumeration	Hhohho	Manzini	Shiselweni	Lubombo
Hhohho	72732	6301	3142	1482
Manzini	6340	72962	7406	2635
Shiselweni	652	1647	87316	732
Lubombo	3779	5372	6843	52098