UNIVERSITY OF SWAZILAND

MAIN EXAMINATION 2009

TITLE OF PAPER: DEMOGRAPHIC METHODS

CORSE NUMBER: DEM 202

TIME ALLOWED: 3 HOURS

INSTRUCTIONS: ANSWER QUESTION 1 AND ANY THREE QUESTIONS. ALL QUESTIONS ARE WORTH 25 MARKS EACH.

REQUIREMENTS: CALCULATOR

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TABLE 1: Population Distribution of a Coastal Region by Age and National Census Survival Ratios between 1996 and 2001.

Age in 1996	Population 1996	Age in 2001	Population 2001	Survival ratios
0-4	95456	5-9	103452	0.99737
5-9	99170	10-14	104886	0.99849
10-14	98415	15-19	101045	0.99672
15-19	93957	20-24	101544	0.99207
20-24	84342	25-29	93220	0.99259
25-29	83598	30-34	92753	0.99350
30-34	70191	35-39	77853	0.99301
35-39	59982	40-44	64334	0.98956
40-44	53313	45-49	55713	0.98223
45-49	55775	50-54	57715	0.96979
50-54	54857	55-59	56099	0.95060
55-59	46881	60-64	48363	0.92191
60+	128674	65+	103715	0.72308

Additional information: Sex Ratio at Birth = 1.04

b) What data sources are needed to implement a cohort component projection for your country of residence? (5)

Question 3

i) Distinguish between the following measures of fertility and show how each is calculated:
   a) Child Woman Ratio and General Fertility Rate (4)
   b) Total fertility rate (2)
   c) Gross reproduction rate and Net reproduction rate (4)

ii) Using the statistics in the table below, calculate:
   a. ASFRs for ages 15-19 to 45-49 (7)
   b. TFR (2)
   c. Gross Reproduction rate (3))
   d. Net Reproduction rate (3)

Table 2: Statistics for Fertility Calculation, Australia, 1996

Age	Total births by age of mother	Female births by age of mother	Total women	${}_nL_x/l_o$
15-19	12509	5988	621542	0.99175
20-24	44837	21807	694273	0.98985
25-29	82782	40278	709746	0.98792
30-34	76435	37227	720453	0.98566
35-39	31864	15359	727555	0.98261
40-44	5113	2470	672182	0.97826
45-49	128	61	640985	0.97152

Question 4

i) Distinguish between an abridged life table and a complete life table. (5)

ii) Define the following life table functions:

a) ${}_nq_x$ (2)
b) e_o (2)
c) ${}_nM_x$ (2)
d) ${}_nL_x$ (2)
e) T_x (2)

iii) Is a stationary population also a stable population? Explain your answer. (5)

iv) At the start of the 21st century, China had an estimated R_0 of 0.81297 and an R_1 of 23.528. Calculate the population's intrinsic rate of natural increase. (5)

Question 5

a) What are the guidelines for choosing a standard population in standardization? (2)

b) Using the data below, compare and discuss death rates for Country A and B using the appropriate method of standardization. (15)

Table 3: Age distribution and age-specific mortality for the UK and Kuwait, 1996

	United Kingdom		Kuwait	
Age group	Population	Deaths	Population	Deaths
0-14	11 358 354	7225	512 179	726
15-29	11 902 658	7571	495 541	317
30-44	12 935 390	16 671	538 018	491
45-59	10 582 022	53 998	166 343	678
60-69	5 418 489	100 896	29 744	587
70+	6 604 552	452 536	12 156	1016

c) Why is it necessary to decompose the difference between two demographic rates? (2)

d) Present a formula for computing the 'age composition effect' when decomposing the difference between two populations' crude death rates and define the components of the formula.(6)

Question 6

a) Using the data given below, calculate the singulate mean age at marriage for females in Mali and England. Interpret your results.(13)

Table 5: Proportions of Females Never Married, Mali and England, 1981

Age group	% single Mali	% single England
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

b) Using Table 4, construct a gross nuptiality table. (14)

Table 4: Number of Women and First Marriages by Age

Age	No. of Women (in thousands)	No. of first marriages (in thousands)
15-19	311.1	19.6
20-24	228.0	18.1
25-29	155.0	4.5
30-34	140.4	1.4
35-39	138.7	0.7
40-44	130.4	0.4
45-49	109.8	0.3
50-54	98.7	0.1