UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION 2009

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

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Question 1

a) The mid-year 1977 female population of Malawi is shown by age group, together with the number of children born to them during 1977.

Age	Population	Births
15-19	280,018	36,853
20-24	254,149	71,119
25-29	233,239	64,160
30-34	161,081	38,803
35-39	144,989	28,348
40-44	109,000	13,708
45-49	113,341	7,830

On the basis of the above data, calculate:
(i) the age specific fertility rates and interpret one of them (5)
(ii) the gross reproduction rate and interpret it (5)
(iii) the mean age of child bearing (2)

b) Distinguish between rates and ratios. (4)

c) A number of rates which are commonly called 'rates' in demography are strictly proportions or ratios. Give two examples of such rates and explain why they are not rates. (4)

d) Describe as clearly as you can the cohort method for adjusting the conventional infant mortality rate, giving the relevant formula as well. (5)

Question 2

a) Define a parity progression ratio and present a formula for its calculation (3)

b) Use the information in Tables 2 and 3 to answer the following questions:

I.   Calculate the parity progression ratios. (8)

II. Calculate the total fertility rate using the above calculated parity progression ratios. (4)

III. Also calculate the total fertility rate using the age-specific fertility rate approach. (2)

IV. If as a result of a family planning campaign, the age-specific fertility rate for the age group 35-39 were reduced by 40%, by what percentage would the fertility rate be reduced? (3)

c) A certain hypothetical population has the following parity progression ratios:

$P_1 = 0.89$
$P_2 = 0.85$
$P_3 = 0.81$

Out of 1,000 women, how many remain childless and how many have exactly one child? (5)

Table 2: Distribution of women by Number of Children Ever Born, Swaziland, 1976

Number of CEB	Number of Women
0	35,217
1	15,332
2	13,565
3	12,387
4	11,770
5	11,285
6	10,029
7	8,733
8	7,362
9+	5,413

Table 3: Age Specific Fertility Rates, Swaziland, 1976

Age	ASFR
15-19	0.169
20-24	0.318
25-29	0.311
30-34	0.264
35-39	0.198
40-44	0.096
45-49	0.014

Question 3

a) It is often said that women generally live longer than men. Discuss this statement.
(6)

b) Why is in necessary to standardize rates? (3)

c) Using the table below, compare and discuss the death rates for the two populations using the appropriate method of standardization. (16)

Population and Deaths (in thousands) 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	4752.2	45.1

Question 4

a) A net nuptiality table is a type of double decrement life table. Which are the two forces of decrement, and which state is being decremented? (3)

b) In a net nuptiality table, what does l_x represent? (2)

c) Briefly describe how you would compute the average age at first marriage, mentioning the data that are needed. (5)

d) Populations that have a low age at marriage tend to have relatively higher levels of fertility. Discuss this statement. (9)

e) Provide the formula for computing the singulate mean age at marriage, defining all the components of the formula. (6)

Question 5

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

a. Using the data in Table 4, construct an abridged life table for the Male population.(20)

TABLE 4:Male Population and Deaths by Age, England and Wales, 1982

Age	Population	Deaths
0-4	1,571,400	4,566
5-9	1,557,600	391
10-14	1,947,500	546
15-19	2,121,200	1,669
20-24	1,942,800	1,668
25-29	1,708,200	1,409
30-34	1,764,700	1,735
35-39	1,734,500	2,246
40-44	1,417,200	3,280
45-49	1,368,500	5,647
50-54	1,381,000	10,497
55-59	1,382, 000	18,820
60-64	1,277,400	27,701
65-69	1,088,600	39,171
70-74	900,100	51,908
75-79	578,400	52,096
80-84	274,500	37,844
85-89	97,200	19,875
90+	32,700	9,119

Question 6

a) Differentiate as clearly as possible, between the following pairs of concepts:
   i.   Marriage and nuptiality. (3)
   ii. Divorce and legal separation. (2)

b) Fill in the missing values numbered (i) to (vi) in Table 5, showing clearly the formulae used for each answer and show your calculations clearly. (12)

TABLE 5: 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	---	---	---	---	---	---

c) Give the formula for projecting male births in a 5-year period using the female age distribution, female age specific fertility rates and male and female life tables. (8)