UNIVERSITY OF SWAZILAND

DEPARTMENT OF STATISTICS AND DEMOGRAPHY

SUPPLEMENTARY EXAMINATION 2016

TITLE OF PAPER :INDIRECT TECHNIQUES OF DEMOGRAPHIC ESTIMATION

COURSE CODE :DEM 303

TIME ALLOWED :THREE (3) HOURS

INSTRUCTIONS

a) ANSWER QUESTION 1 AND ANY OTHER THREE (3) QUESTIONS
b) SHOW ALL YOUR WORKING AND FORMULAE WHERE APPLICABLE
c) EXPRESS YOUR ESSAY ANSWERS IN BULLET POINTS

REQUIREMENTS : CALCULATOR

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

Question 1 [COMPULSORY]

Consider the developing country A whose mortality experience is represented by the life table in Table 1.

Table 1: Mortality experience: Country A

Age x	Number surviving to age x out of 100,000 births
15	96457
20	95800
25	94912
30	94042
35	93044
40	91645
45	89537
50	86259

Using the data in Table 1, and the General Standard life table in **APPENDIX**:

a. What is meant by a relational system of model life tables?. [2]
b. Determine the parameters alpha (α) and beta (β) in a Brass logit model life table fitted to all ages or the data provided above. [10]
c. Interpret the values of the Brass parameters obtained in part b); [4]
d. Derive a fitted life table using the parameters derived in part b) and the General standard; and [2]
e. Compare the fitted life table values with the observed ones. [2]

Answer any THREE (3) questions

Question 2

a. Discuss the importance of indirect techniques of estimation in demography. Elaborate your answer with aid of examples. [4]
b. Briefly describe the characteristics of each region of the Coale and Demeny regional model life tables. [12]
c. Explain how you would select a model life table from the Coale and Demeny regional model life tables to use in a specific demographic estimation. [4]

Question 3

Describe any ONE of the following indirect demographic estimation methods. Make sure to include data requirements and computational procedures of each method.

a. Orphanhood method; [20]
b. Widowhood method; and [20]
c. Brass P/F ratio method. [20]

Question 4

a. What are the assumptions of the Trussell variant of the Brass method for estimating childhood mortality using information from women on the proportion of children dead? [5]

b. You are given data in Table 1 and coefficients in Table 2. Using Trussell variant of the Brass method, calculate q(2) and q(3). [10]

Table 1. Average parity per woman and proportion children dead classified by age group of women

Age group	i	Average parity	Proportion dead
15-19	1	0.156	0.0959
20-24	2	1.326	0.1218
25-29	3	2.765	0.1485

Table 2. Coefficients for estimation of child mortality multipliers, Trussell variant

Age group	i	a(i)	b(i)	c(i)
15-19	1	1.0819	-3.0005	0.8689
20-24	2	1.2846	-0.6181	-0.3024
25-29	3	1.2223	0.0851	-0.4704

Question 5

a) State the assumptions of the widowhood method. [4]

b) What are the advantages of the widowhood method over the orphanhood method? [6]

c) Using the data on the proportion of ever married respondents classified by age given below, calculate the male probability of survival from age 20 to age 35 and from age 20 to 40. [10]

Age	$NW_f(n)$	$NW_f(n-5)$
30	0.9514	0.9729
35	0.9170	0.9514
40	0.8735	0.9170

You may find the following information useful:

n	a(n)	b(n)	c(n)	d(n)
30	-0.0284	-0.00465	-0.00157	1.0822
35	-0.0159	-0.00638	0.00253	1.0831
40	-0.0041	-0.00784	0.00395	1.0596

Assume that SMAM(m)=25.3 years and SMAM(f)=23.2 years.

APPENDIX

Table A1: Brass General and African Standard life table l_x's values

Age x	General Standard l_x	Age x	African Standard l_x
0	1	0	1
1	0.8499	1	0.8802
2	0.807	2	0.8335
3	0.7876	3	0.8101
4	0.7762	4	0.7964
5	0.7691	5	0.7863
10	0.7502	10	0.7502
15	0.7362	15	0.7362
20	0.713	20	0.713
25	0.6826	25	0.6826
30	0.6525	30	0.6525
35	0.6223	35	0.6223
40	0.5898	40	0.5898
45	0.5535	45	0.5535
50	0.5106	50	0.5106
55	0.4585	55	0.4585
60	0.3965	60	0.3965
65	0.321	65	0.321
70	0.238	70	0.238
75	0.1516	75	0.1516
80	0.0768	80	0.0768
85	0.0276	85	0.0276
90	0.0059	90	0.0059
95	0.0006	95	0.0006
100	0	100	0

Source: Carrier and Hobcraft (1973)