UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION 2017

TITLE OF PAPER: DEMOGRAPHIC METHODS II

COURSE NUMBER: DEM 212

TIME ALLOWED: 2 HOURS

INSTRUCTIONS: ANSWER ANY THREE QUESTIONS. ALL QUESTIONS ARE WORTH 30 MARKS EACH.

REQUIREMENTS: CALCULATOR

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

Question 1

a) What are the two important pieces of information in survival analysis? (2)

b) Give 2 uses of survival analysis. (4)

c) Define precisely the following terminologies in survival analysis::
   i. Survival function (2)
   ii. Probability density function (2)
   Iii. Hazard function (2)

d) What are the advantages of survival analysis over the traditional life table? (2)

e) 50 patients with skin melanoma were treated in one hospital during the time period October 1952-June 1967. Patients were followed annually and the study was closed to patient follow up on December 31,1969. 20 deaths occured and 30 observations were censored due to withdrawal or lack of follow-up. The information is summarised in the table below. Using the information given, construct a clinical life table. (16)

Interval in years	**# alive at beginning of interval**	**# of deaths during interval**
0-1	50	9
1-2	41	6
2-3	34	2
3-4	28	1
4-5	22	2
5-6	17	0

Question 2

a) If a community of 30 000 people recorded very low total net migration during the last 20 years, would this indicate that migration was unimportant in mantaining its population? (3)

b) Under what circumstances can census survival ratios exceed 1?(2)

c) Explain whether census survival ratios are suitable for estimating migration in open populations. (5)

d) Employing census survival ratios and the forward survival method, compute the age-s[pecific net intercensal migration of indegenious females to North regions aged 5-9 to 65+ in 2001. Assume the population is closed to external migration;use the national Population figures to calculate the CSR for indigeneous females. (20)

	National population		North region	
Age	**1996 census**	**2001 census**	**1996 census**	**2001 census**
0-4	19625	17358	4509	4059
5-9	20231	18369	4614	4086
10-14	20249	19197	4165	4215
15-19	16472	17910	3990	4353
20-24	12108	14787	3095	3804
25-29	9744	11034	2474	2751
30-34	7459	8964	1871	2214
35-39	7043	7137	1655	1788
40-44	5639	6513	1265	1515
45-49	4743	5259	911	1164
50-54	3479	4221	718	807
55-59	2568	3066	450	594
60-64	1971	2211	381	387
65+	2927	3321	434	522

Question 3

a) What is the major purpose of a multiple decrement table ? (2)

b) Outline the steps for constructing a multiple decrement table that pertains to causes of death. Make sure to include the relevant formula for each step. (10)

c) What are the sources of data for the study of nuptiality? (3)

d) Using the data in the table below,construct a gross nuptiality table. (15)

Female Population by age and number of first marriages

Age	**Number of women (thousands)**	**No of first marriages (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

Question 4

a) What is meant by a stable population? (2)

b) In a stable population which is declining in size, there are typically more people of middle age than at younger or older ages. Explain why. (3)

c) Give 2 uses of stable populations. (4)

d) Using the data in the table below, calculate the intrinsic rate of natural increase. (6)

ASFRs and survival probabilities for country X

Age group	Female ASFRs	Survival Probabilities
15-19	0.01289	0.98615
20-24	0.05007	0.98376
25-29	0.07120	0.98134
30-34	0.03947	0.97877
35-39	0.01205	0.97530
40-44	0.00215	0.96960
45-49	0.00012	0.96003

e) Define the following:

I. Nuptiality table (2)
II. Migration effectiveness (2)
III. Censoring (2)
IV. Follow up time (2)
V. Migration expectancy (2)

f) Explain why the length of a generation is less than the mean age at childbearing in a growing population and greater than the mean age at childbearing in a declining population. (5)