

UNIVERSITY OF SWAZILAND



SUPPLEMENTARY EXAMINATION PAPER 2018

- TITLE OF PAPER :** POPULATION ESTIMATES AND PROJECTIONS
- COURSE CODE :** DEM 301 / DEM 311
- TIME ALLOWED :** TWO (2) HOURS
- INSTRUCTIONS :** 1. ANSWER QUESTION 1 AND ANY TWO QUESTIONS.
2. ALL QUESTIONS ARE WORTH 20 MARKS EACH
- REQUIREMENT :** SCIENTIFIC CALCULATOR

Question 1 [Compulsory]

Table 1: Age specific fertility rates and female population of Lesotho, 2004-2014

Age of mothers	Age specific fertility rates (f_a)			Population (P_a)		
	2004	2009	2014	2004	2009	2014
15-19	91	96	94	293	292	255
20-24	177	171	181	779	860	701
25-29	160	155	140	700	857	757
30-34	122	117	112	593	704	669
35-39	101	74	72	484	522	544
40-44	46	40	49	478	429	377
45-49	9	7	4	383	386	310

Use the data in Table 1 and apply Method B of the Period Fertility Method to calculate:

- Expected births in 2004, 2009 and 2014 [9]
- Projected medium births in 2004, 2009 and 2014 [6]
- Projected medium female births for the five year periods, 2004-2009 and 2009-2014 [5]

[20 marks]

Question 2

- If a population of 100,000 experiences 1,600 births, 2,000 deaths, 100 immigrants, and 250 emigrants in the course of one year. What will be the population after five years? Use the geometric growth model. [5]
- Differentiate between population forecasts and population projections [10]
- In general, projections of future population size tend to be more uncertain or less accurate under certain conditions. Elaborate [5]

[20 marks]

Question 3

- What is the net reproduction rate and where is it applicable in the compilation of population projections? [3]
- Define the cohort component method and outline its general principles of computation [8]

c. Use the information in Table 2 to answer the questions that follow.

Table 2: Sub-Saharan Africa male population (thousands) and person years lived in each interval, 2015

Age group (x)	$n^M N_x^M$ [2015]	$n^M L_x^M$
0-4	69 959	333798
5-9	60 697	222685
10-14	52 820	203003
15-19	46 297	187221
20-24	40 410	169623
25-29	34 229	147934
30-34	28 378	123162
35-39	22 572	96981
40-44	17 718	72275
45-49	14 337	51619
50-54	11 606	35501
55-59	9 326	22907
60-64	7 307	13008
65-69	5 395	5822
70-74	3 579	1693
75+	4 672	189
Total	429 302	

NB: $l_0 = 100\,000$, Births [2020] = 776,835, Births [2025] = 795, 111 Sex ratio: 1.05

- i. Project the 0-4 years age group in the years : 2020 and 2025 [6]
 - ii. Project the 75+ years age group in the year 2020 [3]
- [20 marks]**

Question 4

- a. Explain the two types of approaches that are used to produce consistent national and sub-national projections [4]
- b. What are the criticisms of the Ratio method? [4]
- c. When applying the Census-Cohort Change Method, different computation procedures are employed for ages less than and above 10 years. Define the method and clearly outline its computational procedures. [12]

[20 marks]