

UNIVERSITY OF SWAZILAND



SUPPLEMENTARY EXAMINATION PAPER 2017

TITLE OF PAPER : POPULATION ESTIMATES AND PROJECTIONS

COURSE CODE : DEM 301

TIME ALLOWED : TWO (2) HOURS

INSTRUCTION : ANSWER ANY THREE QUESTIONS

REQUIREMENT : SCIENTIFIC CALCULATOR

Question 1

- a. A critique of the arithmetic growth concept is that real examples of populations that conform to the arithmetic growth progression are uncommon. Explain why demographers still talk about it? Where is this model applicable? [5]
- b. One of the features of projections is that they are normally presented in multiple series. Elaborate [5]
- c. Comprehensively discuss the housing unit method. Give its computational procedure and highlight its advantages and disadvantages. [10]

[20 marks]

Question 2

Use the data in Table 1 to answer the questions below.

Table 1: Ghana's age specific fertility rates and female population, 1998-2014

Age of mothers	Age specific fertility rates (f_a)				Population (P_a)			
	1998	2003	2008	2014	1998	2003	2008	2014
15-19	90	74	66	76	910	1148	1025	1625
20-24	192	176	176	161	900	1012	878	1613
25-29	206	210	206	201	867	951	832	1604
30-34	183	182	173	197	653	802	644	1372
35-39	143	141	118	135	625	722	638	1295
40-44	79	70	59	52	473	579	470	1030
45-49	16	36	8	17	415	477	429	857

Apply Method A of the Period Fertility Method to calculate;

- a. Expected births in 1998, 2003, 2008 and 2014 [12]
- b. Expected female birth for the five year period, 2003-2008 and 2008-2014 [8]

[20 marks]

Question 3

- a. Outline the various measures of evaluating population forecasts [5]
- b. Explain the cohort component method for projecting a closed male population, focussing on the following;
- i. Data requirements [3]
 - ii. Modelling approach and computational procedure for projecting; the youngest age-group (0-4 years), intermediate age-groups and the open ended age-group [12]
- [20 marks]**

Question 4

- a. A country in the central part of Europe had an intrinsic rate of natural increase of 0.1% and 109,000 births recorded in the year 2010. Estimate the births for the years given below using the geometric growth model:
- i. 1998 [3]
 - ii. 2016 [3]
- b. If a population grows at a rate of approximately 5 % per year, how many years are required for the population to double? Apply the exponential model. [2]
- c. The current global human population is about 7.4 billion and is growing at an annual rate of 1.13 % . If the world population were to grow at this rate for the next year, approximately how many people would be added? [2]
- d. Given the global human growth rate in question c. above, when will the global population reach 15 billion? Apply the exponential model [3]
- e. The population of the United States of America was 320, 611,133 on 1st January 2015 and 323, 025, 335 on 1st January 2016. Estimate the population on 28th October 2015. [3]
- f. In your research on population dynamics, you estimate that the population size of a particular country is 60,000. Over the course of a month, you record 400 births and 150 deaths in the population. Estimate r and calculate what the population size is predicted to be in 6 months. Apply the geometric model [4]
- [20 marks]**