



UNIVERSITY EXAMINATIONS
SPECIAL EXAMINATION
FIRST YEAR EXAMINATION FOR THE AWARD OF
DEGREE OF BACHELOR OF SCIENCE MATHEMATICS /APPLIED
STATISTICS
SECOND SEMESTER 2021/2022
(JULY, 2022)

STAT 117: DEMOGRAPHY AND DYNAMIC STATISTICS

STREAM: Y1 S2

TIME: 2 HOURS

DAY: MONDAY, 8.00 AM – 10.00 AM

DATE: 25/07/2022

INSTRUCTIONS:

- 1. Do not write anything on this question paper.**
- 2. Answer Question ONE (Compulsory) and any other TWO Questions.**

QUESTION ONE (30 MARKS)

- a) Name and explain the different sources of demographic data (5marks)
- b) Differentiate the following terms natality, fertility and fecundity (3marks)
- c) List and define the important demographic measures of fertility and mortality (4marks)
- d) The population of Kenya in the 2009 census was 38,349,784. Out of this number 18,546,876 were females and 19,802,908 were males. (4marks)
 - i) Calculate the ratio of males to females and interpret the results
 - ii) Using radix of 1000 estimate the sex rates and interpret the results
- e) What is demographic transition and why is the population growth so slow during the first stage of the transition (5marks)
- f) What are some of the ways that education can play a role in determining family size? (5marks)

QUESTION TWO (20MARKS)

- a) The mid-year population of a country was 16million in 1985, 18million in 1986 and 19.5million in 1987. In these years the number of people who died was 250,000,245,000 and 240,000 respectively
- Find the mean annual crude death rate for the entire period (1985-1987)
 - Calculate the annual average death rate for the period 1985-1987
- b) There were 16,000 live births in a country in 2005. During childbirth, 300 pregnant women died, before giving birth 200 of them died and immediately after giving birth 100 of them died. Calculate the maternal mortality rate.
- c) Discuss the problems that accrue to a country in establishing population register

QUESTION THREE (20 MARKS)

You are provided with data for a county named A in Country Named B

Table 1: Data for county A of Country B

Indicator	Population mid year	No. of women 15-49	Births	Deaths	Girls under 5years	Children under 5 years
2003	100000	-	5000	2000	-	-
2013	120000	20000	6000	1800	20000	40000

Number of births between 2003 and 2013 is 55,000

Number of deaths between 2003 and 2013 is 19,000

Required

- Comment on what happened to the crude birth rate and crude death rate for county A between 2003 and 2013. [3marks]
- Crude rates are not recommended for drawing comparisons between populations. Explain their limitations. [4marks]
- Calculate the rate of natural increase in 2003 and 2013 (2marks)
- Calculate the general fertility rate for county A in 2013.(3marks)
- What was the net migration of region A for Country X between 2003 and 2013? (2marks)
- Using the geometric growth formula, calculate the annual rate of growth of the population between 2003 and 2013. (3marks)
- Assuming an exponential growth of 3 per cent for region A, in how many years would it take for the population of the region double in size? (3marks).

QUESTION FOUR (20 MARKS)

The table below shows the mid-year population and the number of births by age of women in Kenya 1989.

Number of births by age of women in Kenya, 1984

Age group	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Midyear women population	46,417	51,462	51,180	44,906	39,286	27,741	22,841
Women of births	2028	6927	6084	3460	1393	303	19

- i) Calculate age specific fertility rate
 - ii) Construct a line graph and comment on the shape
 - iii) Calculate the total fertility rate
 - iv) Calculate the mean age of childbearing
 - v) Calculate the modal age of childbearing
- b. How can age-sex structure of a population determine the needs of that population

QUESTION FIVE (20 MARKS)

- a) Briefly describe the uses of migration in population change of a given country.
- b) Briefly explain various characteristics of migration
- c) In 1986 the number of persons who departed Kenya to various countries was 635,397 while in the same year 647,763 persons arrived in Kenya. Calculate
 - i) Net migration
 - ii) Gross migration
 - iii) Net migration ratio
 - iv) Immigration and emigration portions
 - v) The crude migration rate
 - vi) The crude emigration rate

- d) Discuss how the Kenyan government two pillars (Universal healthcare and food security) can be achieved using demographic statistics. Illustrate using examples (8marks)