



MACHAKOS UNIVERSITY

University Examinations 2019/2020

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS, STATISTICS AND ACTUARIAL SCIENCE

UNIVERSITY SUPPLEMENTARY EXAMINATION

SST 400: DEMOGRAPHY AND VITAL STATISTICS

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

- a) Define the term demography as used in demographic studies [2 Mrks]
- b) Briefly describe four main uses of demography [4 Mrks]
- c) Give the two types of census that you know, highlighting the differences between them. [4 Mrks]
- d) Briefly explain the following terms [4 Mrks]
 - i. Fertility
 - ii. Mortality
 - iii. Nuptiality
 - iv. Fecundity
- e) Differentiate between the following:
 - i. Crude death rate and specific death rate [2 Mrks]
 - ii. General fertility rate and total fertility rate [2 Mrks]
- f) On January 1, 2012, the population of a community in Ota LGA was 85,000 people. During that year, a total of 2,850 new people moved into that community, while 1,250 moved out to live elsewhere. It was also recorded that during that year, a total of 3,250 babies were born and 1,550 people died. Calculate:
 - i) The population of the community on January 1, 2013 [3 Mrks]
 - ii) The Crude Birth Rate of the community in that year [3 Mrks]
- g) The Mexican population was estimated at 77,938,288 at the 1985 census and at 91,158,290 at the 1995 census. Calculate the exponential growth rate. [4 Mrks]

h) State two basic types of life tables used in demography.

[2 Mrks]

SECTION B: ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

- a) State any four sources of population data

[4 Mrks]
- b) Define maternal mortality as described by the World Health Organization.

[2 Mrks]
- c) The table below gives the population data of a country A in the year 1991.

Age group	Population Size (Mid-Year)	No. of Deaths
0-4	700,762	20,683
5-9	811,363	5,451
10-14	805,642	2,589
15-19	680,614	3,345
20-24	641,571	5,104
25-29	526,107	4,736
30-34	501,298	4,569
35-39	412,006	4,464
40-44	378,508	4,311
45-49	262,852	4,194
50-54	252,843	4,015
55-59	151,305	4,173
60-64	142,293	3,902
65 and over	229,498	21,958

- i) The Population size of Country A in that year.

[2 Mrks]
- ii) Total number of deaths in Country A in that year.

[2 Mrks]
- iii) The Crude death rate in Country A in that year.

[4 Mrks]
- iv) Given that females constitute 52.5% of the population aged between 15 and 49 years, estimate the Child-Woman Ratio in Country A in that year?

[6 Mrks]

QUESTION THREE (20 MARKS)

- a) What is population projection?

[1 Mrks]

- b) Explain five factors that contribute to the high maternal mortality in developing countries. [5 Mrks]
- c) State and explain two types of maternal mortality [4 Mrks]
- d) With the aid of a well labeled diagram, discuss the four stages of the Demographic Transition Theory of a population; hence state where the country Kenya can be placed in the cycle [10 Mrks]

QUESTION FOUR (20 MARKS)

- a) Explain what you understand by the term vital registration as used in demography studies [2 Mrks]
- b) Highlight and briefly explain four statistical uses of Vital Statistics [4 Mrks]
- c) Define the following terms as used in demographic studies
 - i. Life table [2 Mrks]
 - ii. Life expectancy [2 Mrks]

- d) Fill in the remaining gaps in the following life table. [6 Mrks]

Age(x)	q _x	l _x	p _x	d _x
20	0.00723	100000	-	-
21	0.00144	-	0.99856	-
22	0.00092	99134	-	-
23	0.00116	-	-	-
24	0.00374	-	-	-
25	0.00492	98558	0.99508	485

- i) What proportion of males aged 21 are expected to live to age 25? [2 Mrks]
- ii) Out of 2000 males aged 21, how many will die after 25 years? [2 Mrks]

QUESTION FIVE (20 MARKS)

- a) Define the term census [2 Mrks]

b) State and briefly explain any five essential features of census [5 Mrks]

c) Define Infant Mortality Rate and give three reasons why is it important? [5 Mrks]

d) Calculate age specific fertility rate per 1000 women in the following age groups and hence find the total fertility rate per 1000 for five-year age groups. [8 Mrks]

Age group of Mother	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Births (B _a)	43,807	257,872	236,088	115,566	38,450	6,627	5,194
Women (W _a)	1,230,396	1,390,077	1,653,183	1,608,925	1,241,067	941,973	754,356