



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012 – (CITY/ REGULAR)

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE AND BACHELOR OF EDUCATION (SCIENCE)

SMA/SSS/568: DEMOGRAPHIC METHODS

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DATE: FRIDAY 30TH MARCH 2012

TIME: 5.30 P.M – 8.30 P.M

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INSTRUCTIONS

Answer Question ONE and any other two questions.

Q.1 Compulsory (30 marks)

- a) Distribution of completed family size for all Kenyan women for the years 1998/2008

Number of Live children	Year		
	1998	2003	2008
0	2183	2303	2249
1	1103	1212	1270
2	1032	1041	1338
3	803	940	1106
4	694	738	872
5	528	566	554
6+	1552	1393	1055

Calculate the average family sizes for the period 1998-2008. Comment briefly on the changes in fertility in Kenya during this period (13 marks)

- b) How does breast feeding affect infant mortality and fertility? (4 marks)
- c) List down three main determinants of fertility and briefly explain each. (4 ½ marks)
- d) Describe the two types of infant mortality and list the different methods of measurement. (4 marks)
- e) Given below is a set of Taiwan data relating to infant mortality in two periods 1961nd 1962.

1961	1962
6051 1101	7143 1305
$B_{61} = 34441$	$B_{62} = 48216$

Calculate the infant mortality rate using the crude rate and two other rates which improves on it. Comment on your answers. (4 ½ marks)

Q.2 France: Male life table 1954-1955

AGE (x)	Number of survivors	Number of person years lives after age 21 (e_x^o)
0	10,000	697250
1	9546	687477
10	9451	601990
30	9217	415310
50	8411	239030
70	5164	103280

Stating clearly all the assumption made calculate

- i) Life expectancy of French males.
- ii) proportion of males now aged 10-30 years still alive 40 years later
- iii) Average age at death of those who die between 50-70 years
- iv) Proportion of males now aged 10 years who die between 50 and 70 years.
- v) If infant mortality is reduced into half but other mortality conditions remain same, calculate the increased cost to the state of pension of one franc paid to all those reaching age 70.
- vi) Increase in the total population caused by the decline in the mortality described in section (v) above. (14 marks)
- b) Describe the general factors which should be considered when developing a good questionnaire for population census. (4 marks)
- c) Breastfeeding is better than infant formula food. Comment. (2 marks)

Q.3 a) Explain how the equation $TV(t) = V(t+20)$ can represent the projection of a population where T is a 4×4 matrix and $V(\cdot)$ a 4×1 vector representing the population divided into four groups at time t . (6 marks)

b) If the matrix T is truncated such that $T = QDQ^{-1}$, show that

$$V(it) = m_i \lambda_1^n \sum_{j=1}^2 n_j V(jt)$$

Explain the demographic significance of m_i , λ_1 and n_j (8 marks)

c) A population evolves over a long period of time according to the Leslie matrix T where

$$T = \begin{bmatrix} 0.50 & 1.40 & 0.35 \\ 0.80 & 0.00 & 0.00 \\ 0.00 & 0.70 & 0.00 \end{bmatrix}$$

Show that 1.4 is an eigen value of T . (6 marks)

4. a) What are the advantages and disadvantages of the Gross and New reproduction rates as measures of fertility. (4 marks)

Age (x x+4)	Age Specific Birth Rates (Daughters only)	Probability of Surviving from birth to age x
15-19	0.0229	0.974
20-24	0.1100	0.971
25-29	0.1077	0.968
30-34	0.0636	0.964
35-39	0.0305	0.958
40-44	0.0094	0.950
45-49	0.0007	0.936

Calculate the

- Gross Reproductive rate
- Estimate of the Total Fertility rate
- Net reproductive rate

Interpret each of the above (5 marks)

- b) Define the terms morbidity and mortality. Compare the two in Kenya. (5 marks)

c) Calculate the separation factor using the following data

Time	0-1 day	1 day – 6 days	7 days – 27 days	1 months – 3 months	3 months – 6 months	6 on – 1 year
Number of deaths to infants	16199	8801	2912	4776	3758	2001

Interpret the separation factor using Endogenous and Exogenous infant deaths. Is the above country a developed or developing country? (6 marks)