UNIVERSITY OF ESWATINI

DEPARTMENT OF STATISTICS AND DEMOGRAPHY

MAIN EXAMINATION 2019

TITLE OF PAPER : INTRODUCTION TO DEMOGRAPHY

COURSE CODE : DEM 102

TIME ALLOWED : TWO (2) HOURS

INSTRUCTIONS : ANSWER QUESTIONS 1 AND 2 AND EITHER QUESTION 3 OR 4
SHOW ALL YOUR WORKINGS WHERE APPLICABLE.

REQUIREMENTS : SCIENTIFIC CALCULATOR

THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR

Question 1 (COMPULSORY) [25 marks]

a. Briefly explain the rationale for using the mid-year population as a denominator for demographic rates and also write the formula. [4]

Table 1. You are given the following births and infants deaths recorded in country Y in 1967 and 1968.

Year	Births cohorts	Age (yrs)	Deaths	Births
1967	1967	0	2893	142471
1968	1967	0	481	_____
1968	1968	0	2603	138214
1969	1968	0	302142471	_____

b. Using data in **table 2**: What is the conventional infant mortality rate in year 1968? [3]

c. Why is the infant mortality rate used as an indicator for health in a country? [3]

d. Name five (5) issues to consider with regard to occurrence and registration of the IMR [5]

e. Define the following mortality concepts and provide a formula for their calculations

   i. Age specific mortality rate [3]

   ii. Maternal mortality rate [3]

f. Using the data provided in table 2 calculate the maternal mortality rate and maternal mortality ratio for country X in 1990. [4]

Table 2: Data from Country X in 1990

Births	4158212
Maternal deaths	343
Women aged 15-49	65624

Question 2 (COMPULSORY) [25 marks]

You are provided with data in table 3 for region A in Country X.

Table 3: Data for region A of Country Y

Indicator	2000	2010
Population (mid-year)	100 000	120 000
Number of women 15-49	-	20 000
Births	5 000	6 000
Deaths	2 000	1 800
Number of women 15-49	-	20 000
Girls under age 5	-	20 000
Children under age 5	-	40 000
Births between 2000 and 2010		55 000
Deaths between 2000 and 2010		19 000

Based on the data in table 3:

a) Comment on what happened to the crude birth rate and crude death rate for region A between 2000 and 2010. [4]

b) Crude rates are not recommended for drawing comparisons between populations. Explain their limitations. [4]

c) Calculate the rate of natural increase in 2000 and 2010. [3]

d) Calculate the general fertility rate for region A in 2010. [3]

e) What was the net migration of region A for Country X between 2000 and 2010? [4]

f) Using the **geometric** growth formula, calculate the annual rate of growth of the population between 2000 and 2010. [4]

g) 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? [3]

ANSWER

Question 3 [25 marks]

a. The data in **table 4** below relate to a certain African country. They come from a large-sample survey of the population of the country which took place in 1992. You are also told that the total number of urban women in the survey is 1,334 and that the total number of rural women in the survey is 10,518.

i. Calculate the general fertility rates for rural and urban areas; and [6]

ii. Calculate total fertility rates for urban and rural areas. [4]

Table 4: Data for country X in 1992

Age group	Per cent (%) of all women in age group		Age-specific fertility rates (per woman)	
	Urban	Rural	Urban	Rural
15-19	9.7	9.4	0.135	0.165
20-24	10.1	7.8	0.268	0.291
25-29	9	6.3	0.242	0.273
30-34	6.3	5.3	0.210	0.261
35-39	4.7	4.4	0.149	0.202
40-44	3.0	4.4	0.086	0.123
45-49	1.9	3.1	0.012	0.062

b. Table 4 below gives the numbers of births, deaths of infants under 1 year, and deaths of infants aged under 28 days, in a certain developing country in selected recent calendar years:

i. Calculate the percentage of infant deaths in each year which were neonatal deaths; [3]

ii. Calculate the infant mortality rates for each year, and comment on your answers; [5]

iii. Calculate the neonatal mortality rates for each year, and comment on your answers; and [5]

iv. Briefly explain four demographic variables that have a great impact on the chances of survival of infants and young children. [2]

Table 5: Data for country X

Year	Number of Births	Number of deaths	
		At ages under 1 year	At ages under 28 days
1986	755,000	7,180	4,000
1991	792,500	5,820	3,460
1995	732,000	4,520	3,070

OR

Question 4 [25 marks]

a. Define the demographic usage of the term fertility and differentiate period and cohort fertility [6]

Table 6: Data for country Y

Age group	All women	Children born	Female children	$_nS_x$
15-19	394119	18670	9015	0.9742
20-24	335924	75651	36956	0.9713
25-29	313611	69048	33785	0.9683
30-34	351825	46193	22383	0.9644
35-39	372637	23559	11377	0.9587
40-44	334594	6409	31131	0.9500
45-49	321900	456	226	0.9364

Based on the data in table 6:

b. Estimate and interpret the General fertility rate [3]
c. Estimate and interpret the total fertility rate [4]
d. Estimate and interpret the Net Reproductive rate [4]
e. Sketch a graph for the ASFRs [4]
f. What is the difference between net reproduction rate and gross reproduction rate? [4]