UNIVERSITY OF ESWATINI

FIRST SEMESTER EXAMINATION

ACADEMIC YEAR: 2018/19

TITLE OF PAPER: DEMOGRAPHIC METHODS I

COURSE NUMBER: DEM 211

TIME ALLOWED: 2 HOURS

INSTRUCTIONS: ANSWER ALL QUESTIONS IN SECTION A AND ANY TWO FROM SECTION B. ALL QUESTIONS ARE WORTH 30 MARKS EACH.

REQUIREMENTS: CALCULATOR

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

SECTION A (COMPULSORY)

Question 1

1.1 What is standardization? Why is it necessary to standardize rates? (4)

1.2 What are the guidelines for choosing a standard population? (3)

1.3 What is it the purpose of decomposing rates? (3)

1.5 The difference in the crude death rates for Population A and B is partly due to mortality differences and partly due to differences in their age composition. Find the contribution of each of these two components using the data below.(16)

Table 2: Age specific death rates and Proportion of population (weights) for Population A and B

Age group	Population A		Population B	
	r_k^A	w_k^A	R_k^B	W_k^B
0-4	66.96	0.13	5.48	0.13
5-24	3.37	0.44	1.16	0.48
25-44	6.09	0.26	3.23	0.20
45-64	14.69	0.11	11.80	0.13
65+	44.91	0.04	55.04	0.06
Total		1.00		1.00

1.5 Why is Reproductivity measured in terms of mothers and daughters? (4)

SECTION B (ANSWER ANY TWO QUESTIONS)

Question 2

2.1 Describe data sources for mortality and the problems associated with collecting mortality data. (13)

2.2 Use the data below to calculate crude incidence and prevalence rates per 100 000 population : (4)
Total estimated population: 452 780
Total cases of AIDS: 850
Total new cases of AIDS: 95
Total deaths from AIDS: 595

2.3 Someone proposes calculating an infant mortality rate using the number of births in a given calendar year t in the denominator and the number of deaths of persons under age1 in the same calendar year t in the numerator arguing this would better reflect the mortality experience of the birth cohort.

      I.   Why might this suggestion not work well in practice? (2)

II. Suggest a modification to the proposal which should lead to an infant mortality rate which better reflects the experience of births occurring in year t. Use a Lexis diagram to illustrate the rationale behind this argument. (5)

2.4 The table below gives the infant deaths under age 1 in 1991. Calculate the:
  a) Neo natal mortality rate for 1991. (2)
  b) Post neo natal mortality rate for 1990. (2)
  c) Infant mortality rate for 1991(2)

Age at death	Number of deaths	Deaths resulting from births in	
		1990	1991
Under 4 weeks	12 917	-------	12 917
4 weeks – 1 year	7 900	3 950	3 950

Additional information: Births in 1990 = 730 518

1991= 697 097

Question 3

3.1 Define a Parity Progression Ratio (PPR). What data are required to compute PPRs? (3)

3.2 A certain hypothetical cohort has the following parity progression ratios:
  $P_1 = 0.861$
  $P_2 = 0.804$
  $P_3 = 0.555$
  $P_4 = 0.518$

Assuming that no woman in this birth cohort had a fifth child, out of 1,000 women;
  i. How many remain childless? (2)
  ii. How many have only 1 child? (4)
  iii. How many have at least 3 children? (3)

3.3 Compute the cohort total fertility rate. (3)

3.4 In what way is the General Fertility Rate (GFR) a better measure of fertility than the Crude Birth Rate (CBR)? (2)

3.5 Provide the formula for calculating the Singulate Mean Age at first Marriage (SMAM) and describe each component of the formula.(8)

3.6 Calculate the SMAM using the data below. (5)

Percentage never married males, East Sussex, 1991

Age	Percentage single
15-19	99.6
20-24	89.1
25-29	58.6
30-34	33.2
35-39	20.8
40-44	13.7
45-49	10.9
50-54	10.0

Question 4

4.1 Populations that have a low mean age at marriage tend to have relatively higher levels of fertility. Briefly discuss this statement.(4)

4.2 The number of females in mid-1986 of a hypothetical population and the number of male births occurring to them throughout the year are given in the table below. The sex ratio at birth is 103.

Age Group	No. of Women	Male births	Age Specific Fertility Rate
15-19	5400	211	0.077
20-24	5250	666	(i)
25-29	4800	560	(ii)
30-34	4680	427	0.180
35-39	3940	206	0.103
40-44	3760	162	0.085
45-49	2120	43	0.040

i. Calculate the values of the missing age specific fertility rates and interpret them. (6)
ii. Calculate:

   The total fertility rate and interpret it. (4)

   The gross reproduction rate using the indirect method and interpret. (2)
iii. What additional information is needed to compute the net reproduction rate? (2)
iv. Compute the mean age of childbearing. (3)

4.3 What type of data would be needed to implement a cohort component projection for your country of residence? (3)

4.4 You have been asked to prepare a projection of the number of children aged 0-4 in 2020 that survive from births in 2015. Describe in detail the data you would require to make your projection and the approach you would adopt. (6)