namibia university
OF SCIEnCE AnD TECHnOLOGY

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS AND STATISTICS

QUALIFICATION: Bachelor of science in Applied Mathematics and Statistics	
QUALIFICATION CODE: 07BAMS	LEVEL: 6
COURSE CODE: DEM602S	COURSE NAME: DEMOGRAPHY
SESSION: JANUARY 2020	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SECOND OPPORTUNITY / SUPPLEMENTARY EXAMINATION QUESTION PAPER	
EXAMINER	Mr. A.J. ROUX
MODERATOR:	Mr J. J. Swartz

INSTRUCTIONS
1. Answer ALL the questions in the booklet provided.
2. Show clearly all the steps used in the calculations.
3. All written work must be done in blue or black ink and sketches must be done in pencil.

PERMISSIBLE MATERIALS

1. Non-programmable calculator without a cover.

THIS QUESTION PAPER CONSISTS OF 4 PAGES (Including this front page)

QUESTION 1: Introduction to Demography [15]

1.1) State the balancing formula which is used to express population growth. (identify all variables in the formula) (5)

1.2) The demographic perspective influences the way people understand and interpret questions involving populations. Briefly discuss any **one** of the following commonly used (the <u>Malthusian perspective</u>, **or** the <u>Marxist perspective</u>) demographic perspectives. (10)

QUESTION 2 : Fertility & Nuptiality [20]

2.1) Distinguish between the following:

2.1.1) <u>Gross</u> reproduction rate and <u>net</u> reproduction rate (4)

2.1.2) The <u>direct method</u> and the <u>indirect method</u> for calculating the age-standardised birth rate (4)

2.1.3) General Marriage rate and the total marriage rate. (4)

2.2) Consult the Age-specific Birth rate table provided, and answer the following questions:

TABLE 1 : Age-Specific Birth Rates

Age	Births	Female population
10 - 14	9 481	9 387 000
15 - 19	484 976	9 494 000
20 – 24	965 414	8 678 000
25 – 29	1 083 894	9 341 000
30 – 34	890 336	10 179 000
35 – 39	425 194	11 370 000
40 – 44	80 982	11 049 000
45 - 49	3 769	9 607 000

2.2.1) Calculate and interpret the General fertility rate (4)

2.2.2) Calculate and interpret the Total Fertility Rate. (4)

QUESTION 3 : Mortality [43]

3.1) Name and briefly discuss (<u>any five</u>) of the most commonly used indices for measuring mortality [3 x 5 = 15]

3.2) Distinguish between longevity and lifespan (2)

3.3) Name and briefly describe two components or aspects to consider in determining "the ability to resist death" (8)

3.4) Consult the life table provided below, and give the following answers (6 x 3 =18)

TABLE 1 : Abridged Life Table

Period of life between exact ages x and $x + n$	Proportion of persons alive at beginning of age interval dying during interval $_nq_x$	Of 100,000 born alive		Stationary population		Life expectancy[a] e_x^o
		Number alive at beginning of age interval l_x	Number who die during age interval $_nd_x$	In the age interval $_nL_x$	In this and all subsequent age intervals T_x	
0–1	0.00659	100,000	659	99,435	7,907,507	79.1
1–5	0.00135	99,341	134	397,043	7,808,072	78.6
5–10	0.00083	99,207	82	495,812	7,411,029	74.7
10–15	*a*	99,125	92	495,426	6,915,217	69.8
15–20	0.00220	99,033	218	494,654	6,419,791	64.8
20–25	0.00242	98,815	239	493,488	5,925,137	60.0
25–30	0.00311	98,576	307	492,128	5,431,649	55.1
30–35	0.00430	*b*	423	490,336	4,939,521	50.3
35–40	0.00608	97,846	595	487,848	4,449,185	*f*
40–45	0.00858	97,251	834	484,325	3,961,337	40.7
45–50	0.01269	96,417	1,224	479,247	3,477,012	36.1
50–55	0.02036	95,193	*c*	471,421	2,997,765	31.5
55–60	0.03150	93,255	2,938	459,363	*e*	27.1
60–65	0.05068	90,317	4,577	440,808	2,066,981	22.9
65–70	0.07484	85,740	6,417	413,497	1,626,173	19.0
70–75	0.11607	79,323	9,207	*d*	1,212,676	15.3
75–80	0.17495	70,116	12,267	321,360	837,896	12.0
80–84	0.27721	57,849	16,036	250,275	516,536	8.9
85+	1.00000	41,813	41,813	266,261	266,261	6.4

[a]Average number of years of life remaining at the beginning of the age interval.
Source: National Center for Health Statistics, National Vital Statistics Reports, *United States Abridged Life Tables, 1996,* Vol. 47, No. 13, Hyattsville, Maryland, 1998.

3.4.1) The proportion of persons alive at beginning of age interval dying during interval. $_nq_x$ (3)

3.4.2) The number alive (out of 100 000 born alive) at beginning of age interval, l_x (3)

3.4.3) Number who die (out of 100 000 born alive) during age interval, $_n d_x$ (3)

3.4.4) Stationary population in the age interval, $_n L_x$ (3)

3.4.5) Stationary population in this and all subsequent age intervals, T_x (3)

3.4.6) The life expectancy. e_x^0 (3)

QUESTION 4 : Migration   [22]

4.1) Provide three sources of data on international and internal migration. (3)

4.2) State and explain all the variables in an equation which can be used to calculate a "Specific migration rate. (4)

4.3) According to Petersen (1958, 1975) typology distinction was made between five types of migration. Provide and describe these five types of migration, and give relevant example to illustrate the concept. (3 x 5 = 15)

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